MATHS

BOOKS - OSWAL PUBLICATION

TRIANGLES

Stand Alone Mcqs

1. Sides of two similar triangles are in the ratio $4 : 9$. Areas of these triangles are in the ratio. (a) $2 : 3$ (b) $4 : 9$ (c) $81 : 16$ (d) $16 : 81$

Ans-D

    A. $2 : 3$

    B. $4 : 9$

    C. $81 : 16$

D. $16:81$

Answer: D

2. Tick the correct answer and justify: ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is (A) 2:1 (B) 1:2 (C) 4:1 (D) 1:4
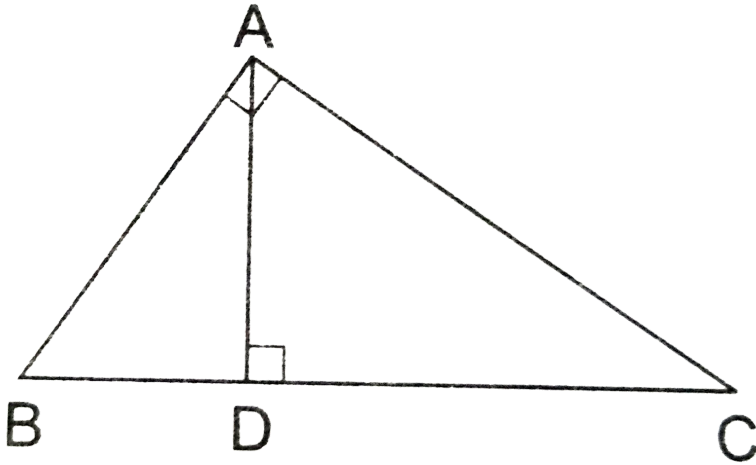
A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer: C

3. In the given figure, $\angle BAC = 90°$ and $AD \perp BC$.then,

A. $BD \times CD = BC^2$

B. $AB \times AC = BC^2$

C. $BD \times CD = AD^2$

D. $AB \times AC = AD^2$

Answer: C

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4. If in two $\triangle ABC$ and $\triangle PQR$, $\dfrac{AB}{QR} = \dfrac{BC}{PR} = \dfrac{CA}{PQ}$, then

A. $\triangle PQR \sim \triangle CAB$

B. $\triangle PQR \sim \triangle ABC$

C. $\triangle CBA \sim \triangle PQR$

D. $\triangle BCA \sim \triangle PQR$

Answer: A

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5. In $\triangle ABC$ and $\triangle DEF$, it is given that $\angle B = \angle E \angle F = \angle C$ and $AB = -3DE$, then the two triangles are

A. congruent but not similar

B. similar but not similar

C. neither congruent nor similar

D. congruent as well as similar

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6. It is given that $\triangle ABC - \triangle PQR$, with $\dfrac{BC}{QR} = \dfrac{1}{4}$. Then $\dfrac{ar\triangle PQR}{ar\triangle ABC}$ is equal to:

A. 16

B. 3

C. $\dfrac{1}{3}$

D. $\dfrac{1}{9}$

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7. In $\triangle ABC$ and $\triangle DEF$, it is given that $\dfrac{AB}{DE} = \dfrac{BC}{FD}$ then

A. $\angle B = \angle E$

B. $\angle A = \angle D$

C. $\angle B = \angle D$

D. $\angle A = \angle F$

Answer: C

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8. If $\triangle ABC \sim \triangle QRP$, $\dfrac{ar(\triangle ABC)}{ar(\triangle PQR)} = \dfrac{9}{4}$, $AB = 18cm$, and $BC = 15cm$, then $PR = ?$

A. 10 cm

B. 12 cm

C. $\dfrac{20}{3} cm$

D. 8 cm

Answer: A

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9. The shadow of a 5-m-long stick is 2m long. At the same time, the length of the shadow of a $12.5m$ high tree is

A. 3.0

B. 5.0

C. 4.5

D. 3.5

Answer: B

10. Fing the length of the altitude of an equelateral trianle with side 6 cm.

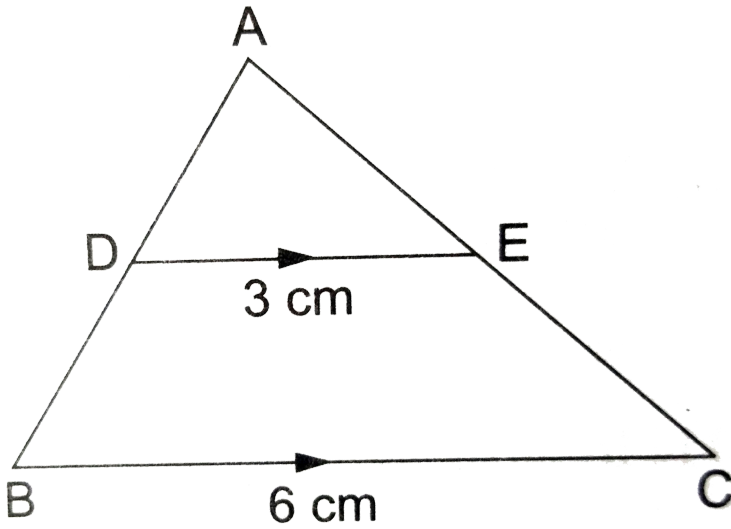A. $2\sqrt{3}$

B. $4\sqrt{3}$

C. $\sqrt{3}$

D. $3\sqrt{3}$

Answer: D

11. In the given figure, $DE || BC$. If $DE = 3cm, BC = 6$ and $ar(\Delta ADE) = 15cm^2$, find the area of

$\triangle ABC.$

A. $70 cm^2$

B. $58 cm^2$

C. $60 cm^2$

D. $64 cm^2$

Answer: C

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12. In $\triangle PQR$ it is given that $= \dfrac{PQ}{PR} = \dfrac{QS}{SR}$. If $\angle Q = 70°$ and $\angle R = 50°$ then $\angle QPS = ?$
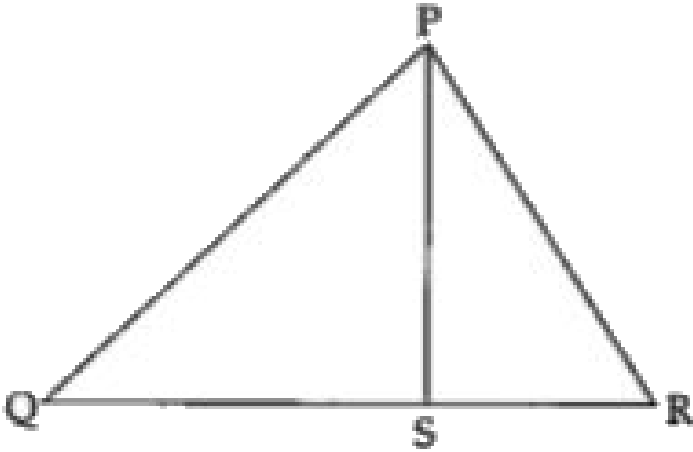
A. $40°$

B. $30°$

C. $45°$

D. $50°$

Answer: B

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13. The areas of two similar triangles are in respectively 16 cm^2 and $9cm^2$. Then the ratio of their corresponding sides is
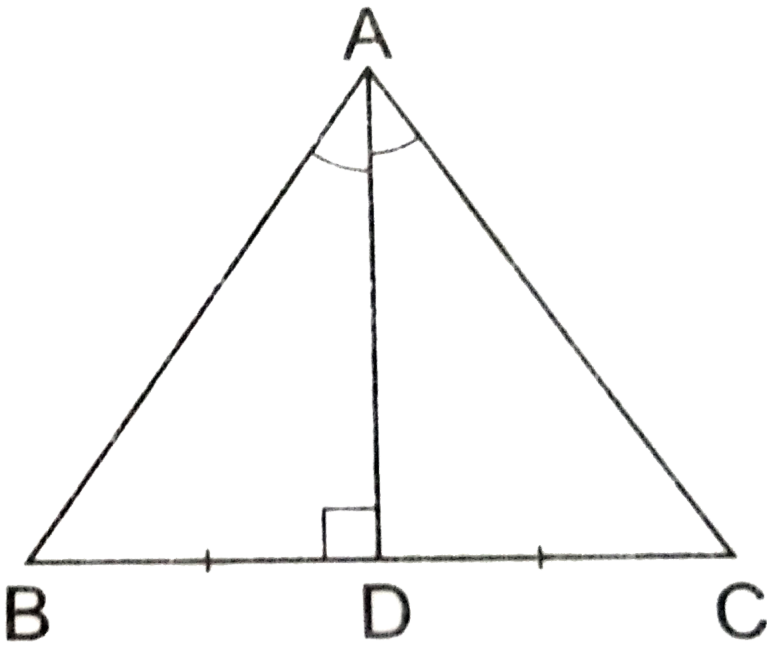
A. $3:4$

B. $2:3$

C. $3:2$

D. $4:3$

Answer: D

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14. In an equilateral triagnle ABC, if $AD \perp BC$ then which of the following is true?

A. $3PQ^2 = 2PS^2$

B. $2PQ^2 = 3PS^2$

C. $4PQ^2 = 3PS^2$

D. $3PQ^2 = 4PS^2$

Answer: D

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15. In $\triangle PQR$, $PQ = 6\sqrt{3}cm$, $PR = 12cm$ and $QR = 6cm$ then $\angle Q$ is

    A. $45°$

    B. $60°$

    C. $90°$

    D. $120°$

Answer: C

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Assertion And Reason Based Mcqs

1. There are two villages at $P(-5, -7)$ and $Q(3, 7)$. The gram pradhan wants to dig a well in such a way that its distance from

both the villages remain the same.

    A. Both A and R are true R is the correct explanation for A.

    B. Both A and R are true nad R is not correct explanation for A.

    C. A is true but R is false.

    D. A is false but R is true.

Answer: A

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2. Assertion (A): Two similar triangles are always congruent.

Reason (R): It the area of two similar triangles are equal then the

triangles are congruent

    A. Both A and R are true R is the correct explanation for A.

    B. Both A and R are true nad R is not correct explanation for A.

C. A is true but R is false.

D. A is false but R is true.

Answer: D

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3. A statements of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as.

Assertion (A): ABC is an isoseles triangle right triangle , right angled at C. Then $AB^2 = 3AC^2$.

Reason (R): In an isosceles triangle ABC if AC = BC and $AB^2 = 2AC^2$ then $\angle C = 90°$.

A. Both A and R are true R is the correct explanation for A.

B. Both A and R are true nad R is not correct explanation for A.

C. A is true but R is false.

D. A is false but R is true.

Answer: D

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4. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

 A. Both A and R are true R is the correct explanation for A.

 B. Both A and R are true nad R is not correct explanation for A.

 C. A is true but R is false.

 D. A is false but R is true.

Answer: A

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1.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Rahul tied the sticks at what angles to each other?

A. $30°$

B. $60°$

C. $90°$

D. $60°$

Answer: C

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2.

Rahul is studying in X Standard. He is making a kite to fly it on a

Sunday. Few questions came to his mind while making the kite. Give

answers to his questions by looking at the figure

Rahul tied the sticks at what angles to each other?

A. RHS

B. SAS

C. SSA

D. AAS

Answer: B

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3.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Sides of two similar triangles are in the ratio 4:9. Corresponding medians of these triangles are in the ratio,

    A. $2:3$

    B. $4:9$

    C. $81:16$

D. $16:81$

Answer: B

4.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle. This theorem is called as,

A. Pythagoras theorem

B. Thale theorem

C. Converse of Pythagoras theorem

D. Converse of Pythagoras theorem

Answer: D

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5.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

What is the area of the kite, formed by two perpendicular sticks of length 6 cm and 8 cm?

A. $48cm^2$

B. $14cm^2$

C. $24cm^2$

D. $96cm^2$

Answer: C

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6. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\frac{1}{2}$ hours?

A. 1500 km

B. 1600 km

C. 1400 km

D. 1300 km

Answer: A

7. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\frac{1}{2}$ hours?

A. 1700 km

B. 1800 km

C. 1900 km

D. 2000 km

Answer: B

8. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\dfrac{1}{2}$ hours?

A. $300\sqrt{59}$ km

B. $300\sqrt{63}km$

C. $300\sqrt{61}$ km

D. $300\sqrt{65}$ km

Answer: C

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9. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same

airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\dfrac{1}{2}$ hours?

A. right

B. obtuse

C. acute

D. None of these

Answer: A

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10. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

A. Basic Proportionality

B. Converse of Thales theorem

C. Pythagoras theorem

D. Similarity of triangles

Answer: A

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11. In $\triangle ABC$, $AB:BC:DC = 3:1:3$
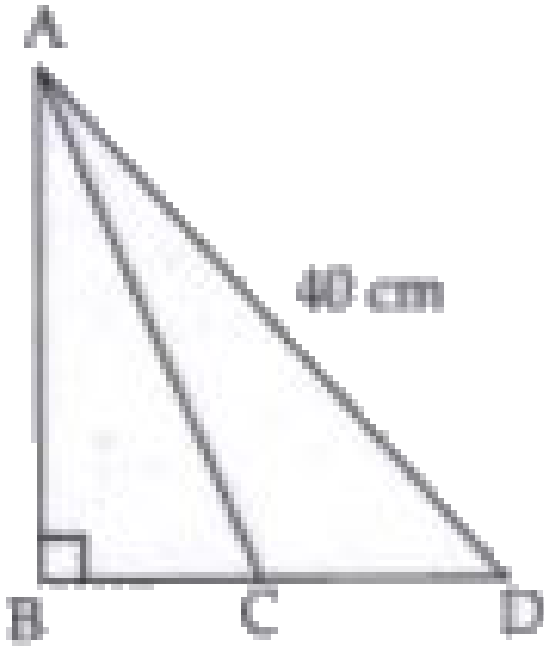
FInd the lenght of AB

A. 8 cm

B. 16 cm

C. 24 cm

D. 32 cm

Answer: C

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12. In $\triangle ABC$, $AB:BC:DC = 3:1:3$
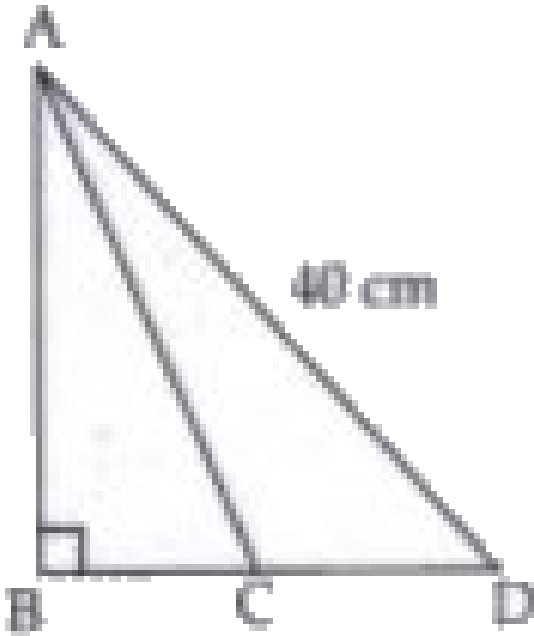
Find the lenght of BD

    A. 8 cm

    B. 16 cm

    C. 24 cm

    D. 32 cm

Answer: D

13. In $\triangle ABC$, $AB:BC:DC = 3:1:3$
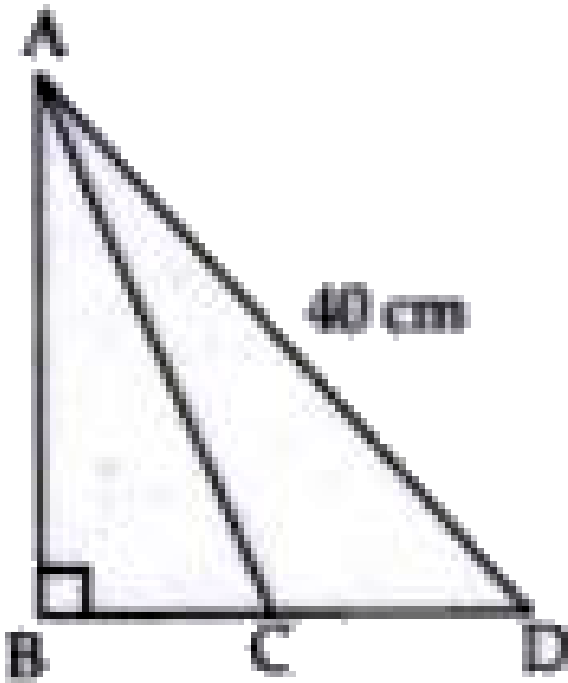
Find the lenght of CD

A. $8\sqrt{3}cm$

B. $16\sqrt{3}$ cm

C. 24 cm

D. 32 cm

Answer: C

14. In $\triangle\,ABC,\,AB:BC:DC = 3:1:3$
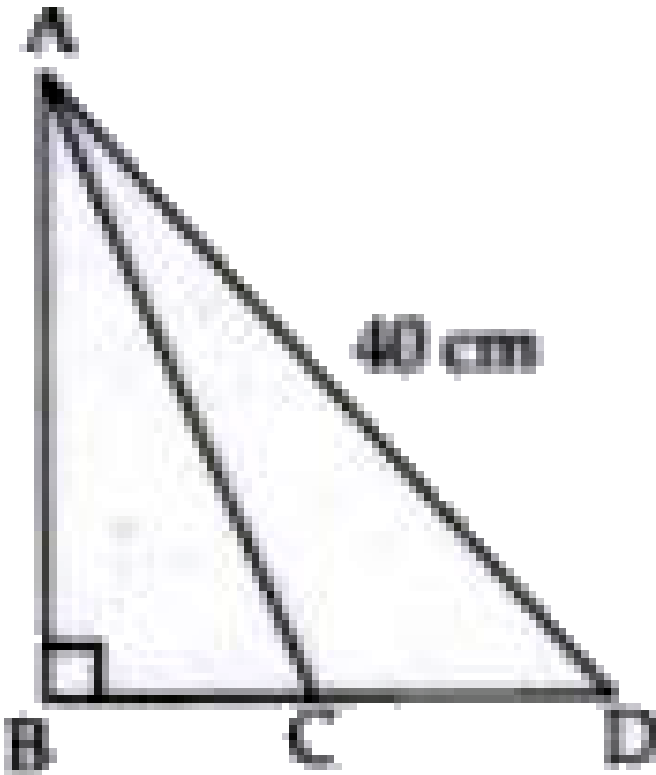
Find the lenght of AC

A. $8\sqrt{2}$ cm

B. $8\sqrt{5}$ cm

C. $8\sqrt{3}$ cm

D. $8\sqrt{10}$ cm

Answer: D

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15. In $\triangle ABC$, $AB:BC:DC = 3:1:3$
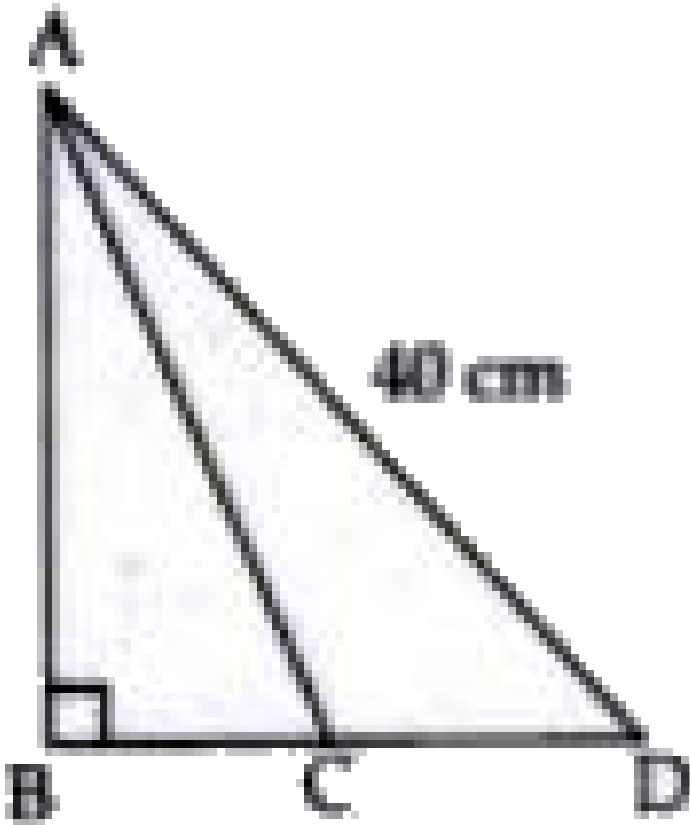
Find BC + CD

   A. 8 cm

   B. $16\sqrt{3}$ cm

   C. 24 cm

D. 32 cm

Answer: D

Example

1. In the given figure DEFG is a square and $\angle BAC = 90°$. Show that $FG^2 = BG \times FC$.
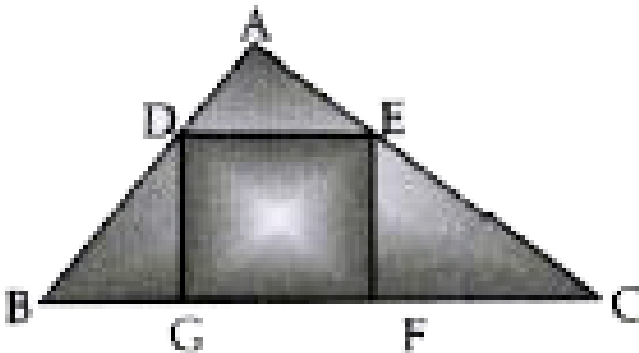
2. In $\triangle ABC$ if AD is the median the show that
$$AB^2 + AC^2 = 2(AD^2 + BD^2)$$
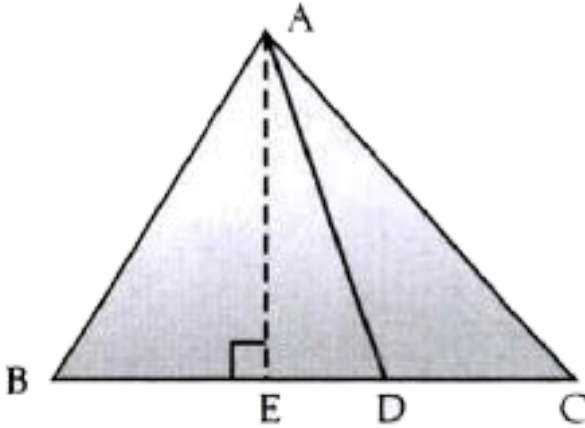
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Self Assessment 1

1. In $\triangle ABC$, DE || BC then the value of x is
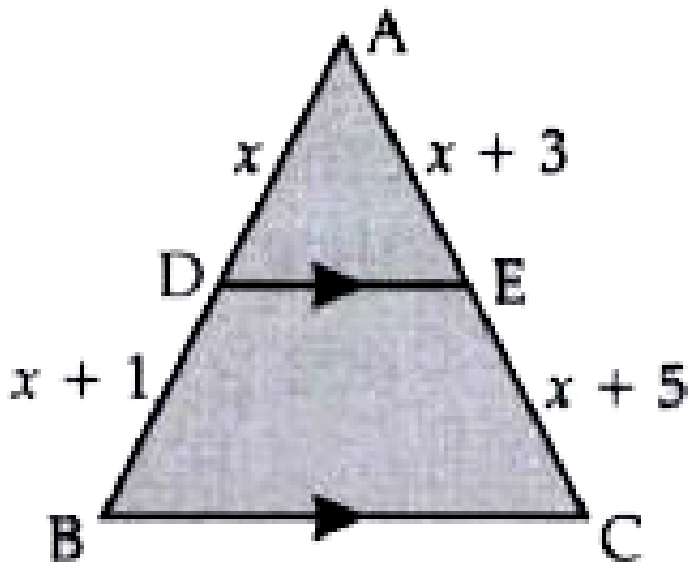
A. x=5

B. x=3

C. x=1

D. x=2

Answer: B

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2. In the given figure if DE|| BC . Then EC =
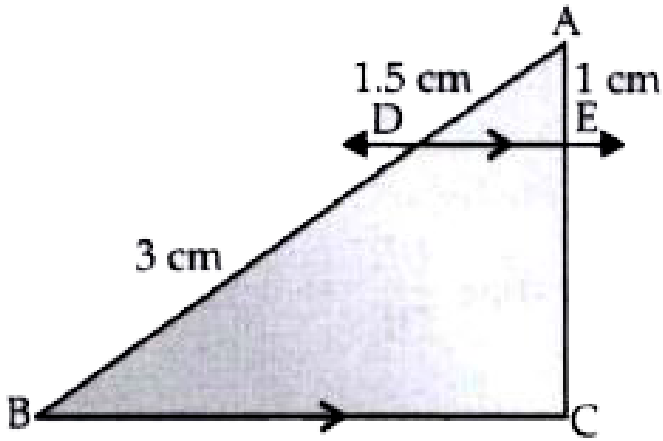
A. 2 cm

B. 1 cm

C. 4 cm

D. 3 cm

Answer: A

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3. If triangle ABC is similar to triangle DEF such that 2AB = DE and BC

= 8 cm then EF is .
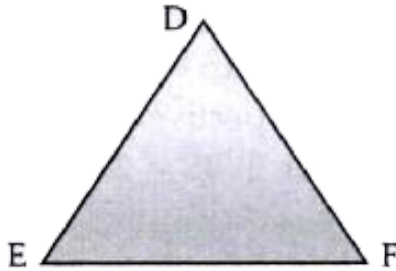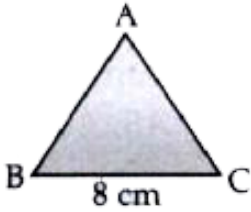
A. 8 cm

B. 2 cm

C. 16 cm

D. 4 cm

Answer: C

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Self Assessment 1 Fill In The Blanks

1. In Figure DE|| BC find the length of side AD is .... Given that AE = 1.8 cm ,BD = 7.2 cm and CE = 5.4 cm .

2. In the given figure PQ is parallel to MN . If $\dfrac{KP}{PM} = \dfrac{4}{13}$ and KN = 20.4 cm then find KQ = ...
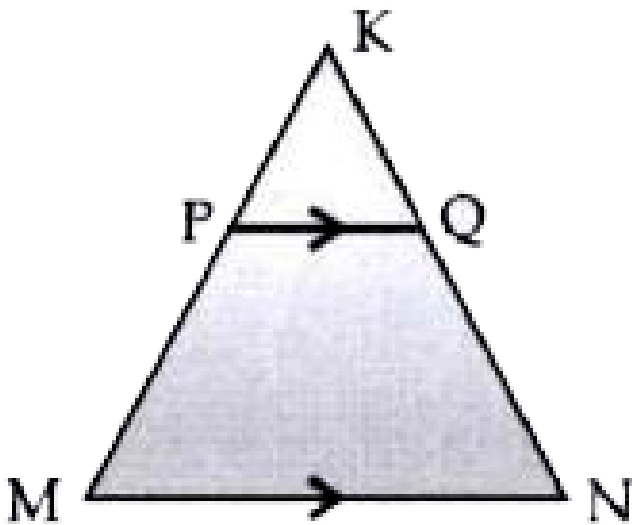
3. In figure if AD = 6 , DB =9 cm , AE =8 cm and EC =12 cm and $\angle ADE = 48°$. Find $\angle ABC$.
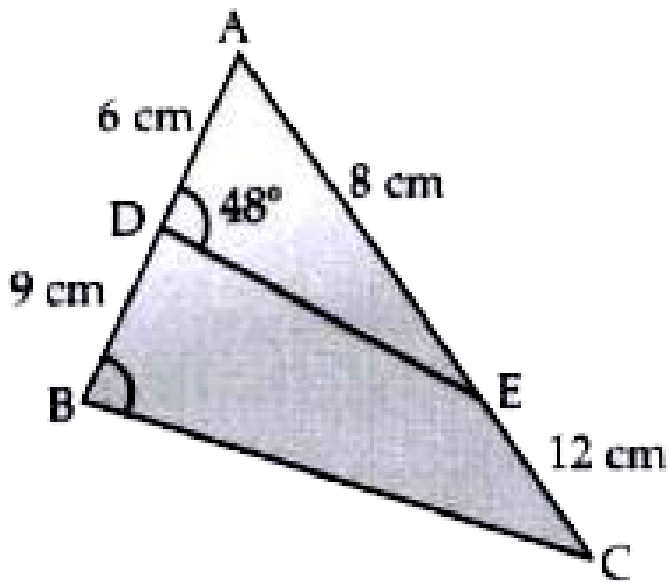
Self Assessment 1 Ii Short Answer Type Questions I

1. In the given figure of $\triangle ABC$, D and E are points on CA and CB respectively such that DE ∥ AB, AD = 2x, DC = x + 3, BE = 2x – 1, CE = x

find x.

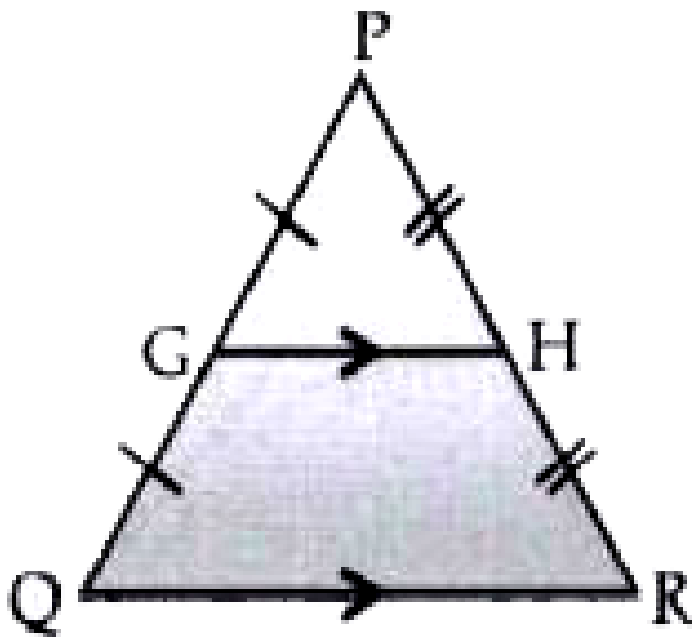**2.** In the given figure G is the mid-point of the side PQ of $\triangle PQR$ and GH || QR .Prove that H is the mid -point of the side PR of the
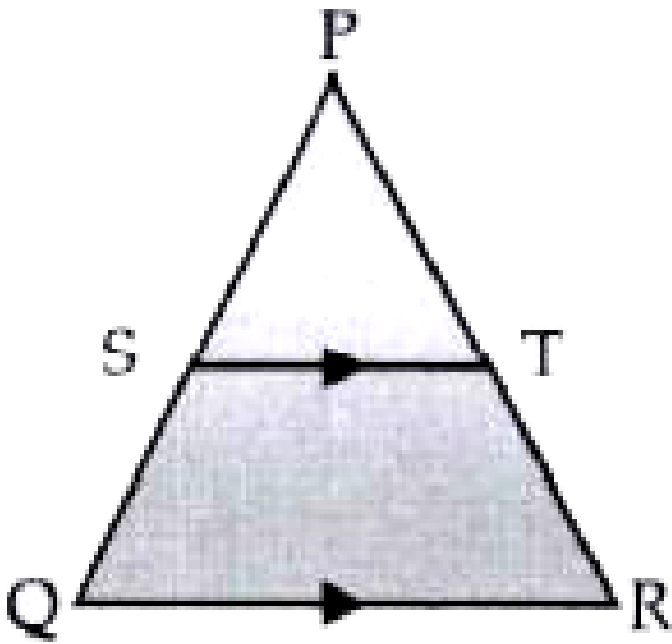
triangle PQR .

3. In the given figure in a triangle PQR, ST || QR and $\dfrac{PS}{SQ} = \dfrac{3}{5}$ and

PR = 28 cm find PT .

Self Assessment 1 Iii Short Answer Type Questions Ii

1. In the given figure, $LM||CB||$ and $LN |\ | CD$.

Prove that $\dfrac{AM}{AB} = \dfrac{AN}{AD}$
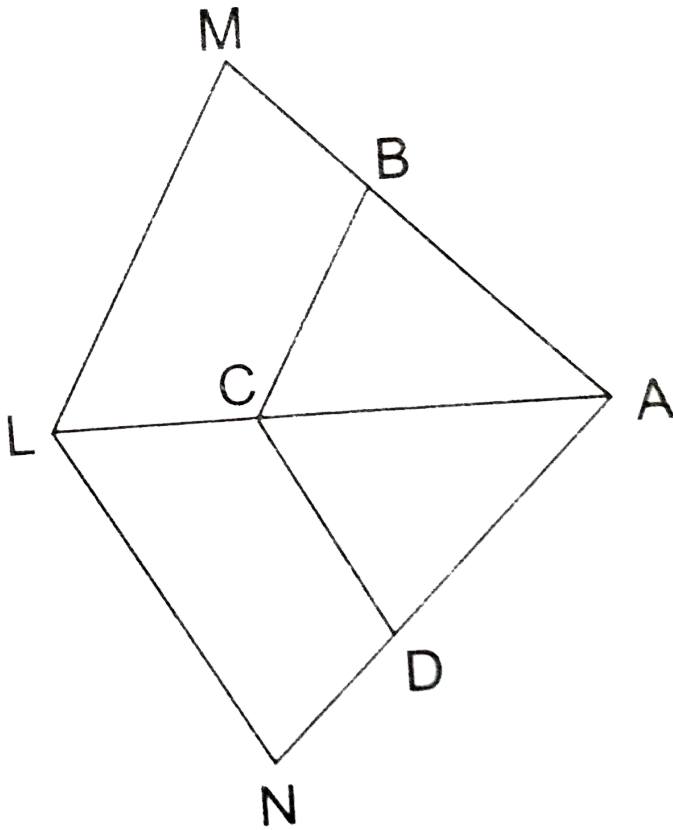
2. If the diagonals of a quadrilateral divide each other proportionally; then it is a trapezium.
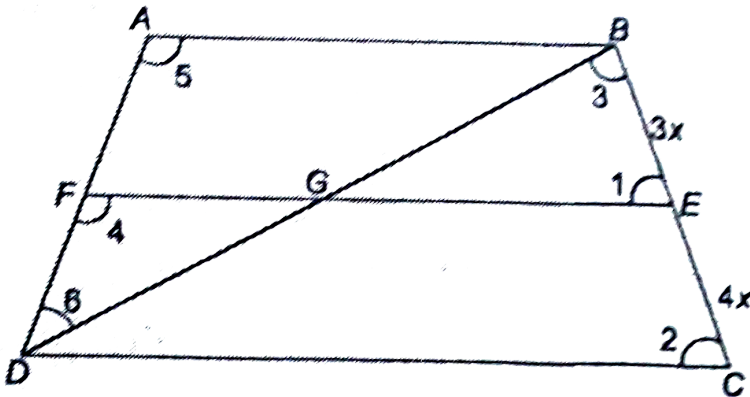
1. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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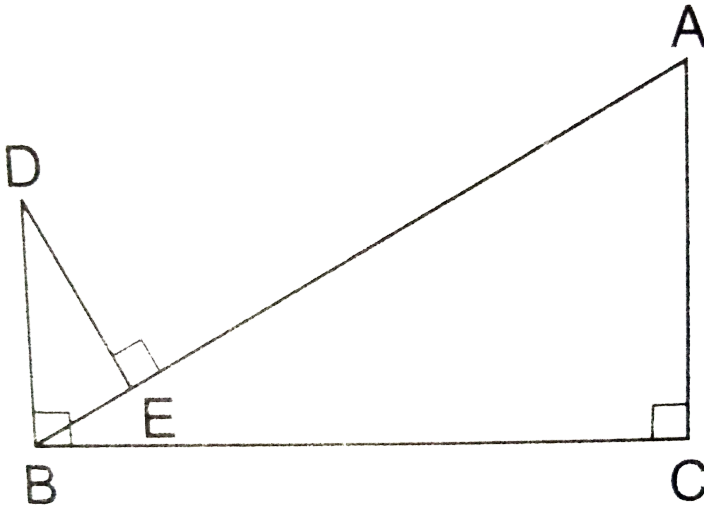2. In trapezium ABCD. AB||DC and DC = 2AB. A line segment EF drawn parallel to AB cuts AD in F and BC in E such that $\dfrac{BE}{EC} = \dfrac{3}{4}$. Diagonal DB intersects EF at G. prove that &EF= 10AB.

3. In the given figure, $DB \perp BC$, $DE \perp AB$ and $AC \perp BC$.

Prove that $\dfrac{BE}{DE} = \dfrac{AC}{BC}$

Self Assessment 2 I Objective Type Questions A Multiple Choice Questons

1. In an equilateral triangle of side $3\sqrt{3}$ cm then length of the altitude is
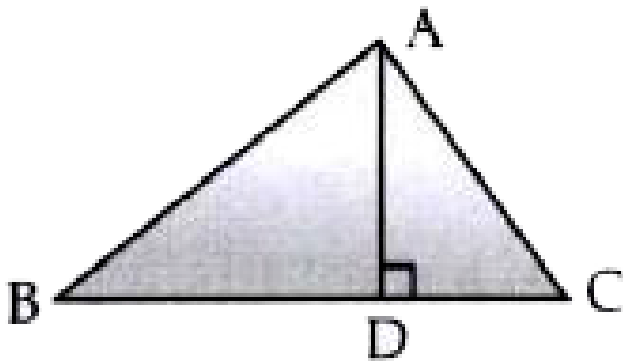
A. h = 4 cm

B. h = 5 cm

C. h = 4.5 cm

D. h = 5.5 cm

Answer: C

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2. In $\triangle ABC$, AD $\perp$ BC such that $AD^2 = BD \times CD$. Then $\triangle ABC$ is a _____ at A .

A. right angled

B. obtuse angled

C. Acute angled

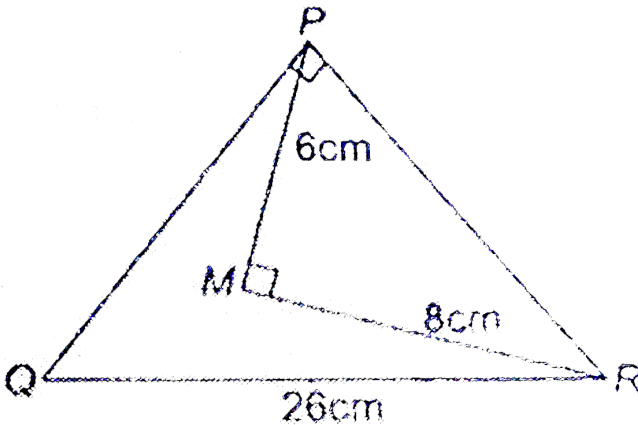D. Reflex angled

Answer: A

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Self Assessment 2 I B Fill In The Blanks

1. A man goes 10m due east and then 24 m due north. Find the distance from the starting point.

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1. In the given figure , $\angle QPR = 90°$ QR = 26 cm PM = 6cm, MR = 8cm and $\angle PMR = 90°$. Find the area of triangle PQR.

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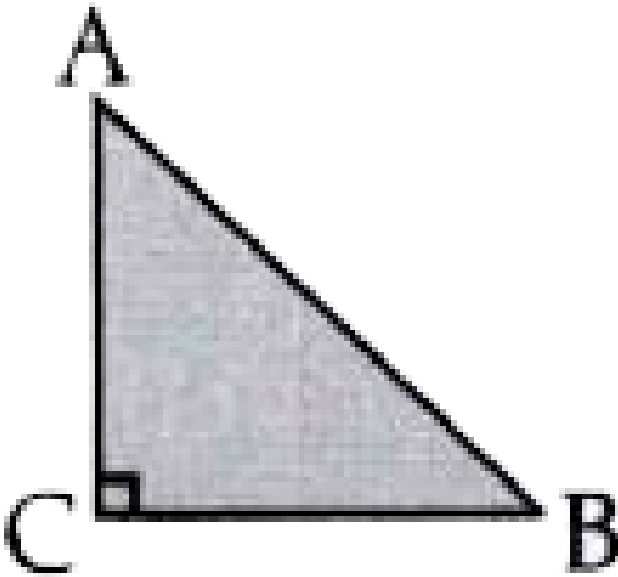
2. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$.

3. In Figure ABC is an isosceles triangle right angled at C with AC = 4 cm . Find the length of AB .

1. In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.
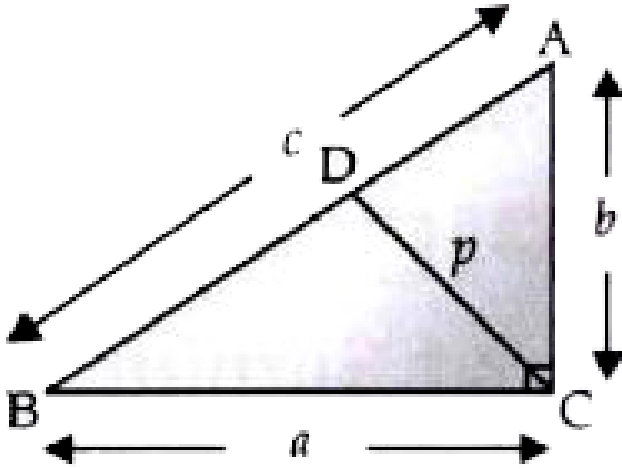
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2. Prove that is a right angle triangle, the square of the hypotenuse is equal the sum of the squares of other two sides.

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3. ABC is a right triangles right angled at C . Let BC =a ,CA=b, AB = c, and p be the length of perpendicular from C to AB . Prove that cp =

ab .

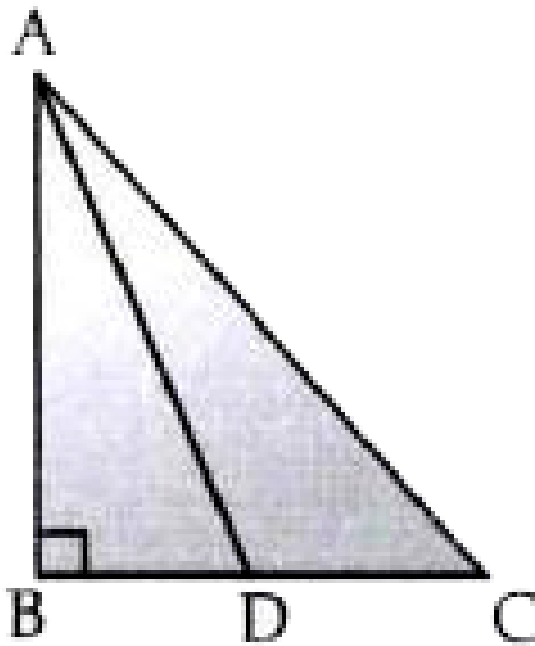## Self Assessment 2 Iii Short Answer Type Questions Ii

1. In the given figure ABC is a right angled triangle with $\angle B = 90°$.
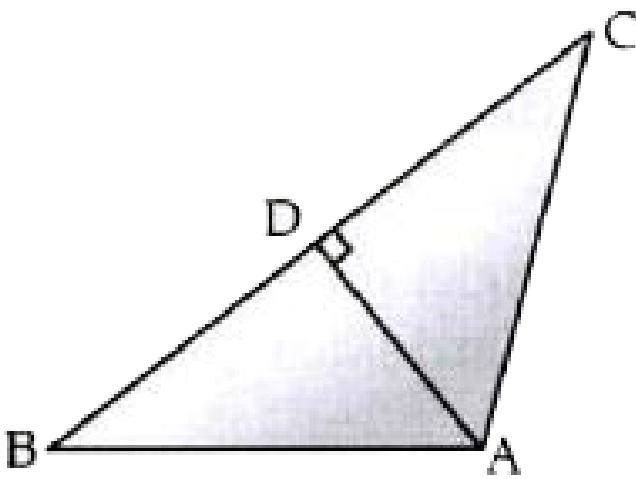
D is the mid -point of BC . Show that $AC^2 = AD^2 + 3CD^2$.

2. In the given figure if AD $\perp$ BC prove that
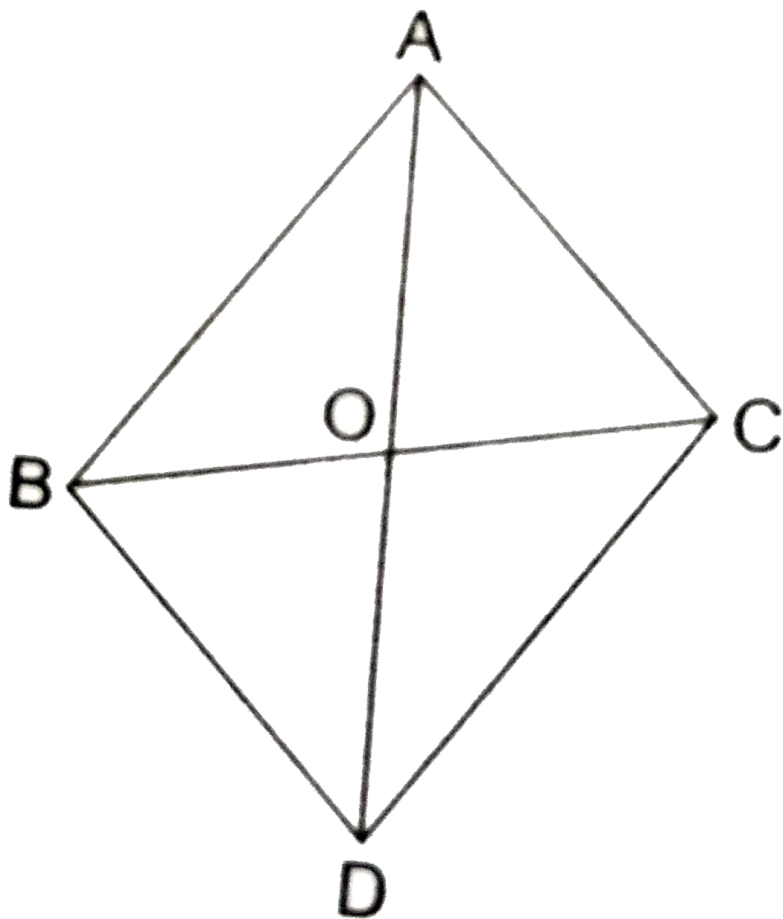
$$AB^2 + CD^2 = BD^2 + AC^2$$

3. In the same figure, $\triangle ABC$ and $\triangle DBC$ are on the same base BC

. If AD is intersects BC at O, prove that

$$\frac{ar(\Delta ABC)}{ar(\Delta DBC)} = \frac{AO}{DO}$$

Self Assessment 2 Iv Long Answer Type Questions

1. The following figure shows a triangle ABC in which AD is a median and $AE \perp BC.$ Prove that $2AB^2 + 2AC^2 = 4AD^2 + BC^2$.
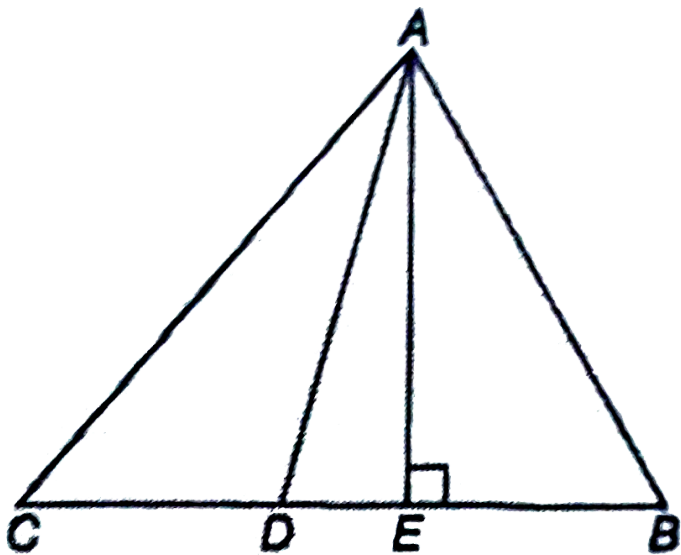
2. In an equilateral triangle ABC, D is a point on side BC such that $BD = \dfrac{1}{3}BC.$ Prove that $9AD^2 = 7AB^2.$

3. In figure, ABC is a right triangle, right angled at B. AD and CE are the two medians drawn from A and C respectively. If AC = 5 cm and $AD = \dfrac{3\sqrt{5}}{2}\,cm$, find the length of CE:
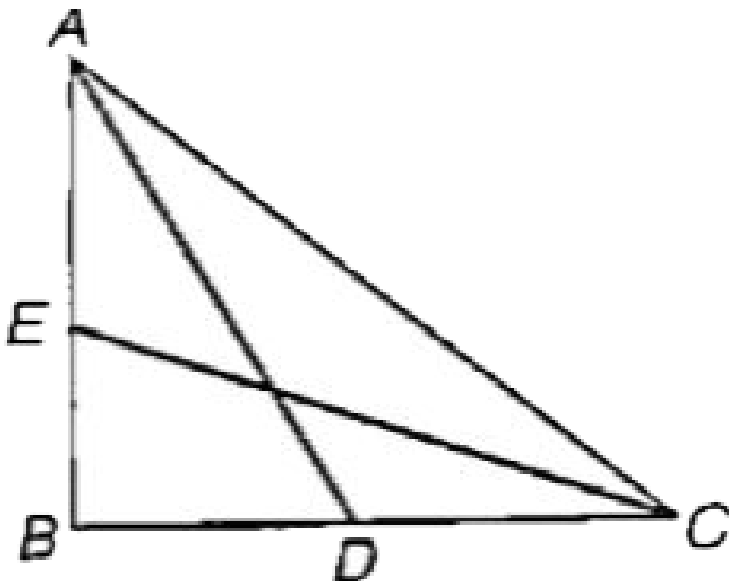
Self Assessment 2 Vi Case Study Based Questions

1.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Rahul tied the sticks at what angles to each other?

A. $30°$

B. $60°$

C. $90°$

D. 120°

Answer:

2.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Which is the correct similarity criteria applicable for smaller triangles at the upper part of this kite?

A. RHS

B. SAS

C. SSA

D. AAS

Answer:

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3.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

Sides of two similar triangles are in the ratio 4:9. Corresponding medians of these triangles are in the ratio,

A. $2:3$

B. $4:9$

C. $81:16$

D. $16 : 81$

Answer:

4.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle. This theorem is called as,

A. Pythagoras theorem

B. Thales theorem

C. Converse of Thales theorem

D. Converse of Pythagoras theorem

Answer:

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5.

Rahul is studying in X Standard. He is making a kite to fly it on a Sunday. Few questions came to his mind while making the kite. Give answers to his questions by looking at the figure

What is the area of the kite, formed by two perpendicular sticks of length 6 cm and 8 cm?

A. $48cm(2)$

B. $14cm(2)$

C. $24cm^2$

D. $96cm^2$

Answer:

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6. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\frac{1}{2}$ hours?

    A. 1500 km

    B. 1600 km

    C. 1400 km

    D. 1300 km

Answer:

7. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same tune, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. |How far apart will be the two planes after 1`1/2

A. 1700 km

B. 1800 km

C. 1900 km

D. 2000 km

Answer:

8. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\frac{1}{2}$ hours?

A. $300\sqrt{59}$ km

B. $300\sqrt{63}$ km

C. $300\sqrt{61}$ km

D. $300\sqrt{65}$ km

Answer:

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9. An aeroplane leaves an airport and flies due north at a speed of 1000km/hr. At the same time, another aeroplane leaves the same

airport and flies due west at a speed of 1200km/hr. How far apart will be the two planes after $1\frac{1}{2}$ hours?

A. right

B. obtuse

C. acute

D. None of these

Answer:

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10. An aeroplane leaves an airport and flies due west at a speed of 2100 km/hr. At the same time, another aeroplane leaves the same place at airport and flies due south at a speed of 2000 km/hr. How far apart will be the two planes after 1 hour?
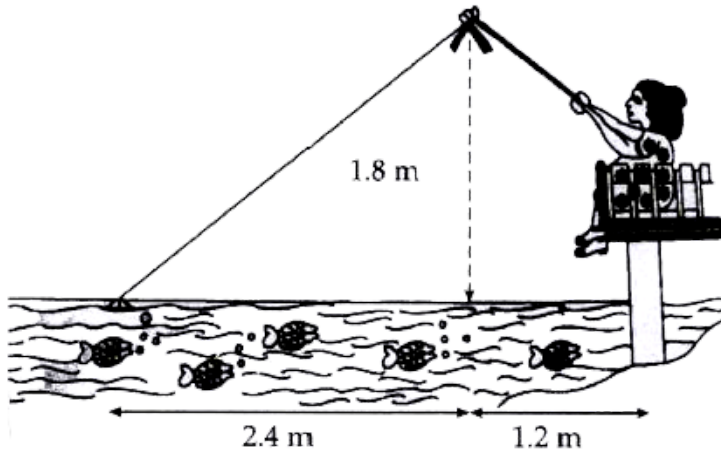
A. Basic Proportionality

B. Converse of Thales theorem

C. Pythagoras theorem

D. Similarity of triangles

Answer:

11. Nazima is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod.

1.8 m

2.4 m   1.2 m

Assuming that her string (form the tip of her rod to the fly) is taut, how much string does she have out (see figure)?

A. 2 cm

B. 3 cm

C. 4 cm

D. 5 cm

Answer:

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12. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that h

    A. 0.5 cm

    B. 3 cm

    C. 4 cm

    D. 5 cm

Answer:

13. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under

the tip of the rod. Assuming that her string (from the tip of her rod to the fly) is taut, how much string does she have out? If she pulls in the string at the rate of 5 cm per second, what will be the horizontal distance of the fly from her after 12 seconds?

A. 2.79 m

B. 3.79 m

C. 5.79 m

D. 4.79 m

Answer:

14. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string

rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that h

A. median

B. vertex

C. Altitude

D. Perimeter

Answer:

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15. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that h

A. Base

B. Perpendicular

C. Hypotenuse

D. Vertex

Answer:

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1. All circles are .... (congruent, similar)

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**2.** All squares are ___. (congruent/similar)

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3. Fill in the blanks using the correct word given in brackets: All circles are .... (congruent, similar) All squares are .... (similar, congruent) (iii) All ...... triangles are similar (isosceles, equilaterals):

4. Fill in the blanks using the correct word given in bracket: (i) All circles are_____(congruent, similar) (ii) All squares are____. (similar, congruent) (iii) All_____triangles are similar, (isosceles, equilateral) (iv) Two polygons of the

5. Give two different examples of pair of (i) similar figures. (ii) non-similar figures.

6. State whether the following quadrilaterals are similar or not:
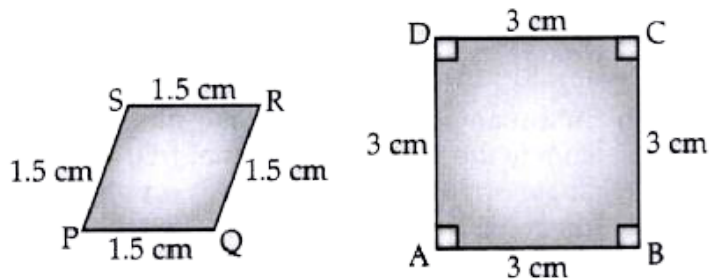
Ncert Corner Textbook Questions Exercise 6 2

1. In Figure (i) and (ii), DE||BC. Find EC in (i) and AD in (ii).

**2.** E and F are points on the sides PQ and PR respectively of ΔPQR. For each of the following cases, state whether EF || QR: (i) PE = 3.9 cm. EQ = 3 cm. PF = 3.6 cm and FR = 2.4 (ii) PE = 4 cm. QE = 4.5 cm. PF = S cm and RF = 9 cm(iii)

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**3.** E and F are points on the sides PQ and PR respectively of ΔPQR. For each of the following cases, state whether EF || QR: (i) PE = 3.9 cm. EQ = 3 cm. PF = 3.6 cm and FR = 2.4 (ii) PE = 4 cm. QE = 4.5 cm. PF = S cm and RF = 9 cm(iii)

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4. E and F are points on the sides PQ and PR respectively of ΔPQR. For each of the following cases, state whether EF || QR: (i) PE = 3.9

cm. EQ = 3 cm. PF = 3.6 cm and FR = 2.4 (ii) PE = 4 cm. QE = 4.5 cm. PF =

S cm and RF = 9 cm(iii)
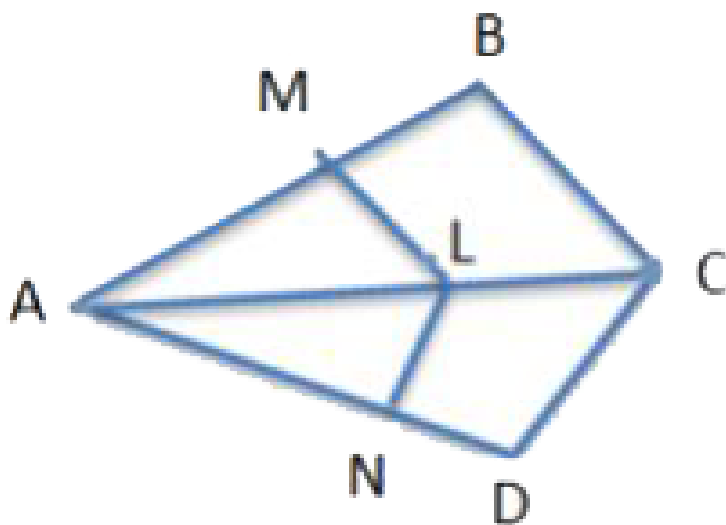
5.

In the fig. if LM || CB and LN || CD, prove that $\dfrac{AM}{AB} = \dfrac{AN}{AD}$

6. In the given figure, $DE||AC$ and $DF||AE$.

Prove that $\dfrac{BF}{FE} = \dfrac{BE}{EC}$
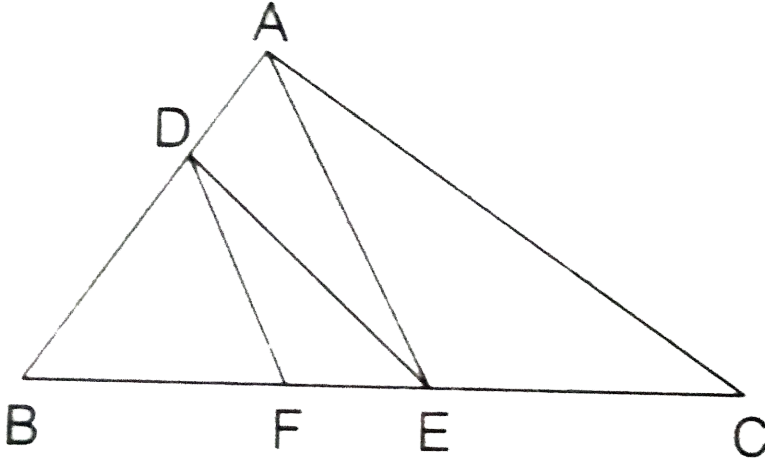
7. In figure DE || OQ and DF || OR. Show that EF||QR.

8. In figure A, B and C are points on OP, OQ and OR respectively such that AB || PQ and AC || PR. Show that BC || QR.

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9. Theorem 8.10 : The line drawn through the mid-point of one side of a triangle, parallel to another side bisects the third side.

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10. Prove that the line joining the mid-points of the two sides of a triangle is parallel to the third side.

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11. ABCD is a trapezium in which AB||DC and its diagonals intersect each other at the point O. Show that $\dfrac{AO}{BO} = \dfrac{CO}{DO}$.
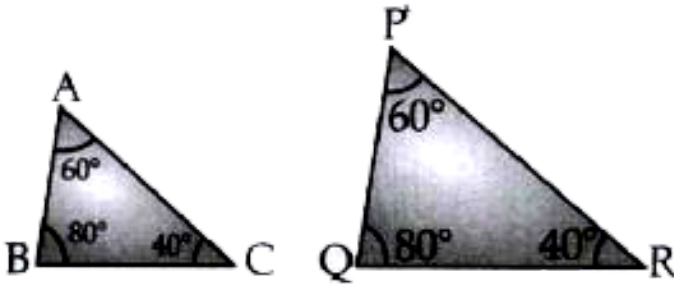
12. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\dfrac{AO}{BO} = \dfrac{CO}{DO}$. Show that ABCD is a trapezium.
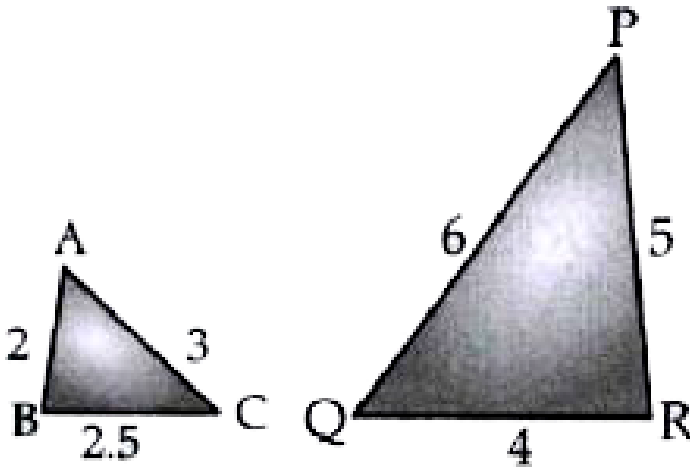
Ncert Corner Textbook Questions Exercise 6 3

1. State the pairs of triangles in the given figures are similar.

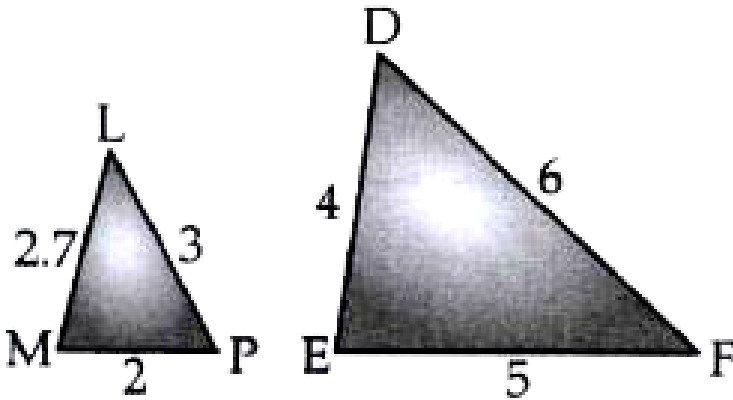**2.** State the pairs of triangles in the given figures are similar.

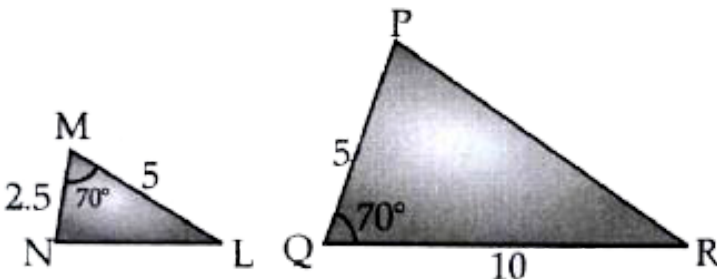**3.** State the pairs of triangles in the given figures are similar

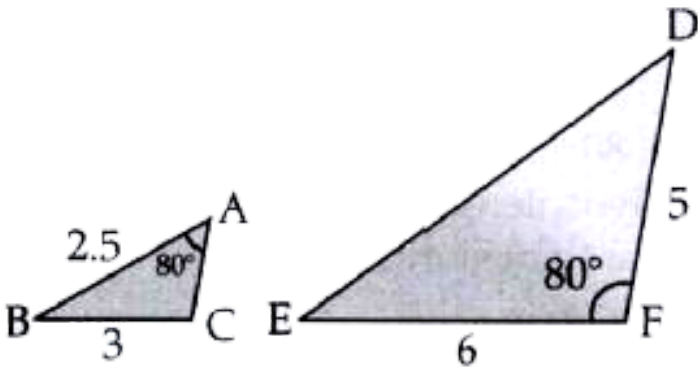**4.** State the pairs of triangles in the given figures are similar . Write the similarity criterion used by you for answering the question and also writer the pairs of similar triangles in the symbolic from :
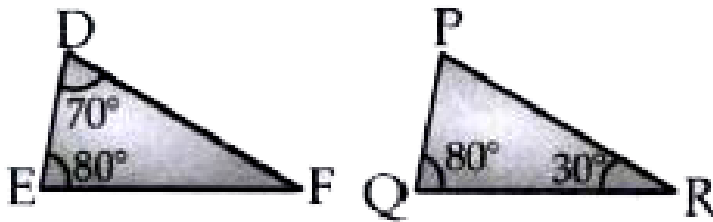
5. State the pairs of triangles in the given figures are similar . Write the similarity criterion used by you for answering the question and also writer the pairs of similar triangles in the symbolic from :
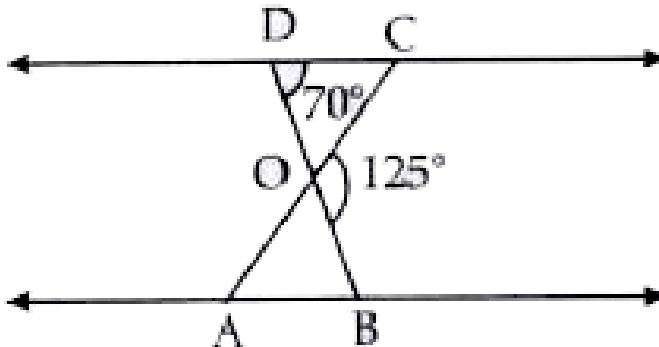
6. State the pairs of triangles in the given figures are similar . Write the similarity criterion used by you for answering the question and

also writer the pairs of similar triangles in the symbolic from :

7. In the figure below $\triangle ODC \sim \triangle OBA$, $\angle BOC = 125°$ and $\angle CDO = 70°$. Find $\angle DOC$, $\angle DCO$ and $\angle OAB$.
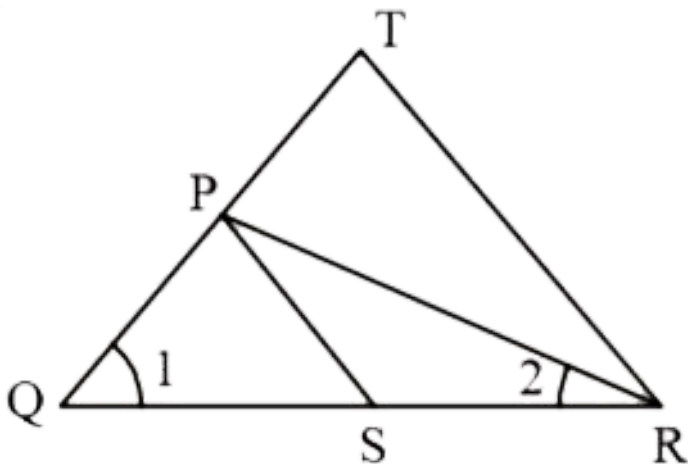
8. Diagonals AC and BD of a trapezium ABCD with AB ∥ DC intersect each other at the point O. Using a similarity criterion for two triangles, show that $\dfrac{OA}{OC} = \dfrac{OB}{OD}$

9. In the given figure, $\dfrac{QR}{QS} = \dfrac{QT}{PR}$ and $\angle 1 = \angle 2$ then prove that $\triangle PQS \sim \triangle TQR$.

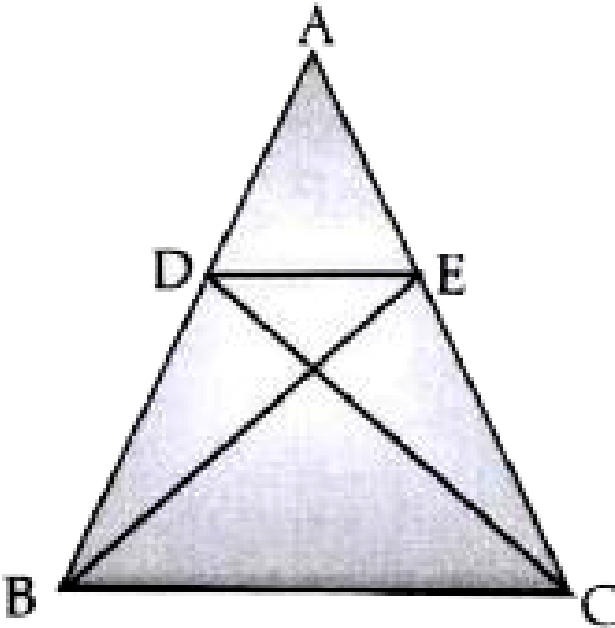**10.** S and T are points on sides PR and QR of $\triangle PQR$ such that $\angle P = \angle RTS$. Show that $\triangle RPQ \triangle RTS$.

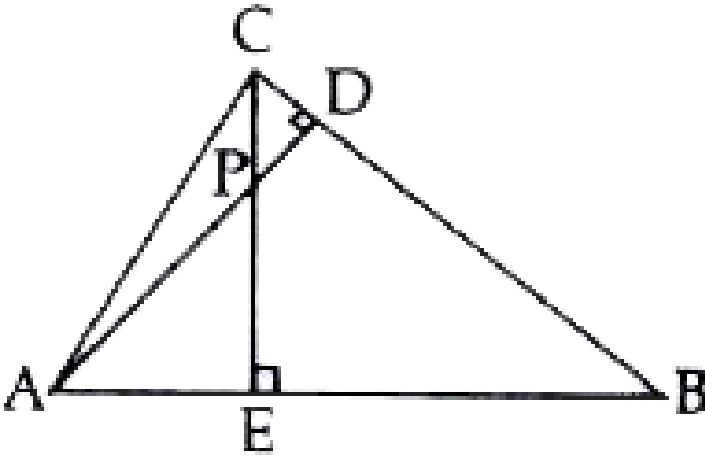**11.** In the Figure given below if $\triangle ABE \cong \triangle ACD$ show that $\triangle ADE \sim \triangle ABC$.
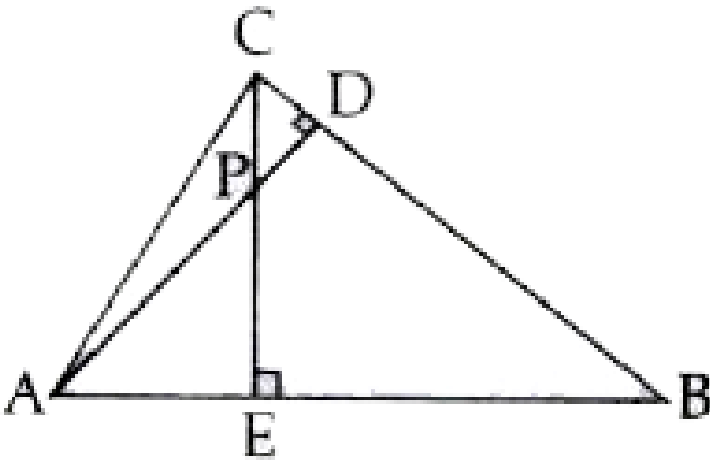
12. In the figure given below altiudes AD and CE of $\triangle ABC$ intersect

each other at the point P. Show that .

$\triangle AEP \sim \triangle CDP$

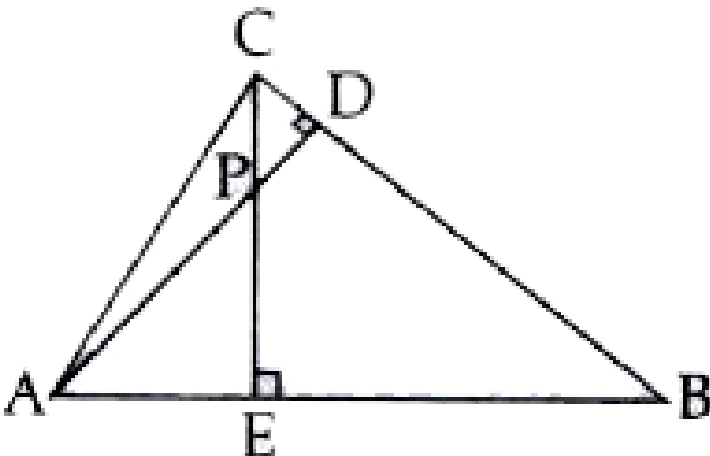**13.** In the figure given below altiudes AD and CE of $\triangle ABC$ intersect

each other at the point P. Show that .

$\Delta ABD \sim \Delta CBE$

14. Show that: $\Delta AEP \sim \Delta ADB$

15. Show that : $\triangle PDC \sim \triangle BEC$
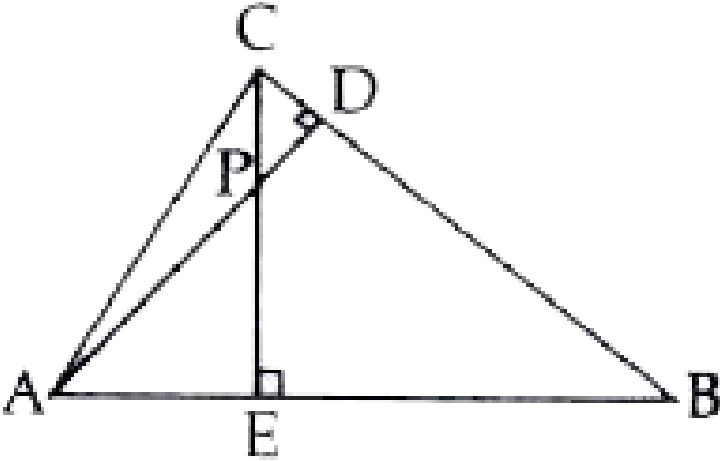
16. E is a point on the side AD produced of a parallelogram ABCD and BE intersects CD at F. Show that $\triangle ABE \triangle CFB$.

17. In the figure given below ABC and AMP are two right triangles right angled at B and M respectively .Prove that
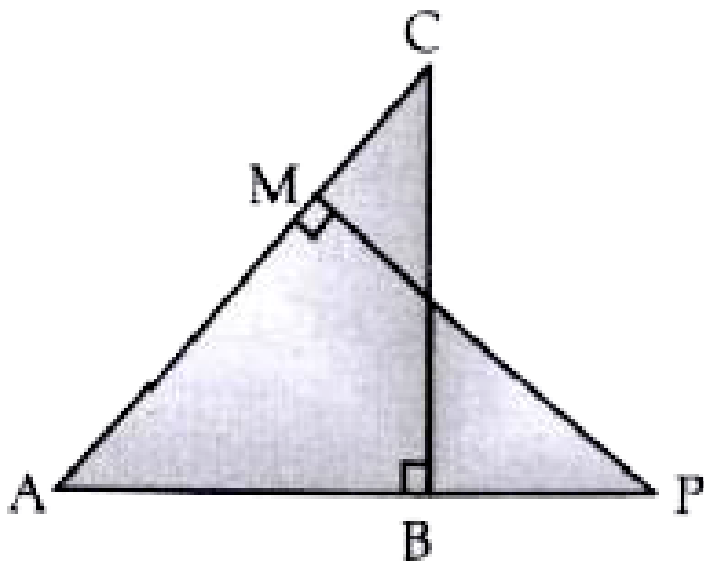
$\Delta ABC \sim \Delta AMP$

18. In figure ABC and AMP are two right triangles, right angles at B and M respectively. Prove that (i) $\Delta ABC \Delta AMP$ (ii) $\dfrac{CA}{PA} = \dfrac{BC}{MP}$

19. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$ show that :

$$\frac{CD}{GH} = \frac{AC}{FG}$$

20. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ such that D and H lie on sides AB and FE of $\triangle ABC$ and $\triangle EFG$ respectively. If $\triangle ABC \sim \triangle FEG$ show that :

$$\triangle DCB \sim \triangle HGE$$

21. CD and GH are respectively the bisectors of $\angle ACB$ and $\angle EGF$ of ΔABC and ΔEFG respectively. If $\Delta ABC \sim \Delta FEG$ show that :

$\Delta DCA \sim \Delta HGF$

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22. In the given figure, E is a point on side CB produced of an isosceles ΔABC with $AB = AC.$. If $AD \perp BC$ and $EF \perp AC$, prove tha $\Delta ABD \sim \Delta ECF$

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23. Sides AB and BC and median AD of a triangle ABC are respectively proportional to sides PQ and QR and median PM of ΔPQR. Show that $\Delta ABC \Delta PQR$.

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24. In the given figure , D is a point on the side BC of $\triangle ABC$ such that $\angle ADC = \angle BAC.$ Prove that $CA^2 = CB \times CD.$
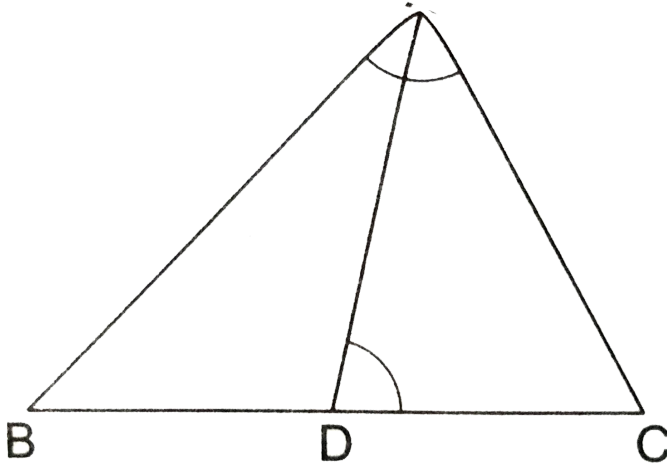
25. Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\triangle ABC \triangle PQR.$

26. A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

27. If AD and PM are medians of triangles ABC and PQR, respectively where$\triangle ABC \triangle PQR$, prove that $\dfrac{AB}{PQ} = \dfrac{AD}{PM}$

Ncert Corner Textbook Questions Exercise 6 4

1. Let $\triangle ABC \backsim \triangle DEF$ and their areas be respectively 64 cm^2 and $121cm^2$. If EF = 15.4 cm find BC .

2. Diagonals of a trapezium ABCD with AB ∥ DC intersect each other at the point O. If AB = 2 CD, find the ratio of the areas of triangles AOB and COD.

3. In figure ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that $\dfrac{ar(ABC)}{ar(DBC)} = \dfrac{AO}{DO}$.

4. If the areas of two similar triangles are equal, prove that they are congruent.

5. D, E and F are respectively the mid-points of sides AB. BC and CA ofΔABC. Find the ratio of the areas of DDEF andΔABC.

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6. Theorem 6.6 : The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

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7. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

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8. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. The ratio of the areas of the triangles ABC and BDE is $2:1$ (b) $1:2$ (c) $4:1$ (d) $1:4$

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer: C

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9. Sides of two similar triangles are in the ratio $4:9$. Areas of these triangles are in the ratio. (a) $2:3$ (b) $4:9$ (c) $81:16$ (d) $16:81$

Ans-D

A. $2:3$

B. $4:9$

C. $81:16$

D. $16:81$

Answer: D

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Ncert Corner Textbook Questions Exercise 6 5

1. Determine which of them are right triangles.

5 cm , 2 cm and 5 cm

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2. Determine which of them are right triangles.

7 cm , 13 cm and 8 cm

3. Sides of triangles are given below . Determine which of them are right triangles . In case of a right triangle write the length of its hypotenuse .

50 cm ,80 cm and 100 cm

4. Sides of triangles are given below. Determine which of them are right triangles. In case of a right triangle, write the length of its hypotenuse.

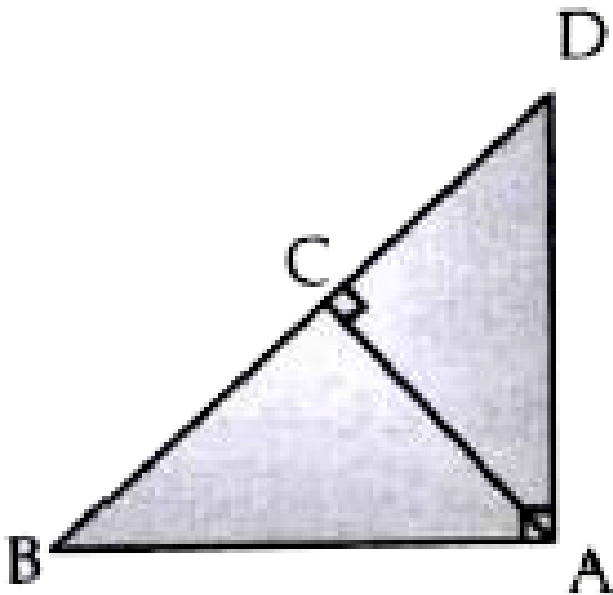(i) 13 cm, 12 cm, 5 cm (ii) 20 cm, 25 cm, 30 cm.

5. PQR is a triangle right angled at P and M is a point on QR such that $PM \perp QR.$ Show that $PM^2 = QM\dot{M}R.$

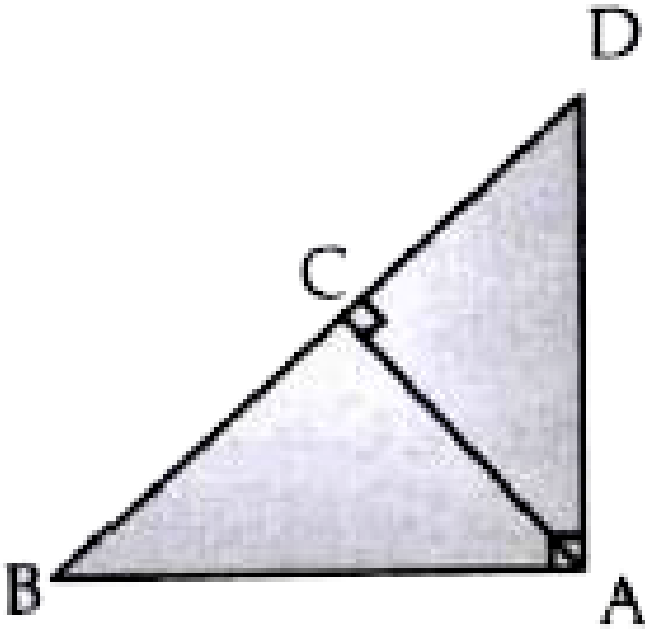**6.** In the figure given below ABC is a triangle right angled at A and AC $\perp$ CD . Show that

$AC^2 = BC \times DC$

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7. In the figure given below ABC is a triangle right angled at A and

AC $\perp$ BD . Show that

$AD^2 = BD \times DC$

> ▶ **Watch Video Solution**

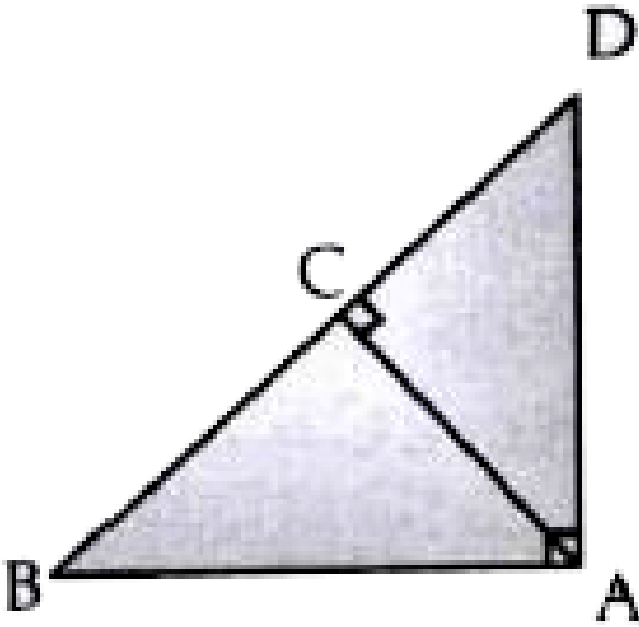**8.** In the figure given below ABC is a triangle right angled at A and

AC $\perp$ BD . Show that

$$AB^2 = BC \times BD$$

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9. ABC is an isosceles triangle right angled at C. Prove that $AB^2 = 2AC^2$.

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10. ABC is an isosceles triangle with AC = BC. If $AB^2 = 2AC^2$, prove that ABC is a right triangle.

11. ABC is an equilateral triangle of side $2a$. Find each of its altitudes.

12. Prove that the sum of the squares of the sides of a rhombus is equal to the sum of the squares of its diagonals.
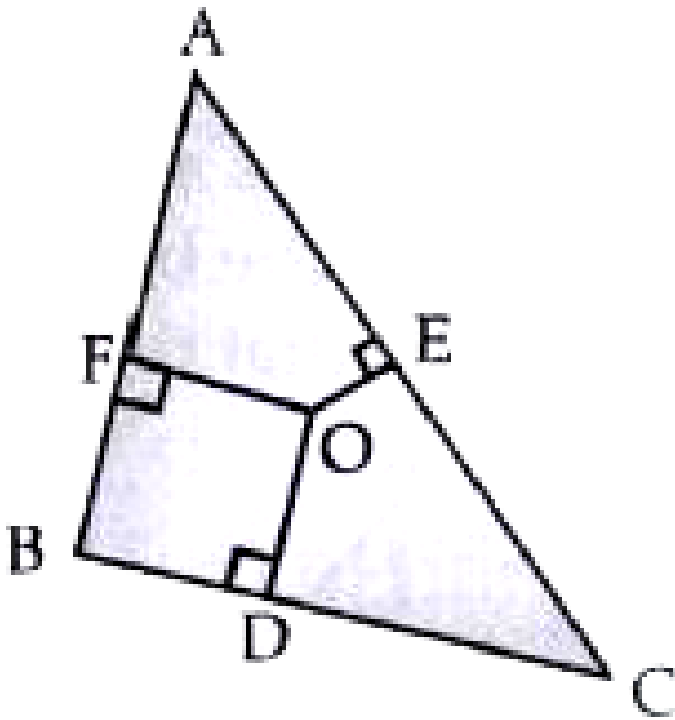
13. In fig., O is a point in the interior of a triangle ABC, OD $\perp$ BC, OE $\perp$ AC and OF $\perp$ AB. Show that:-

$$OA^2 + OB^2 + OC^2 - OD^2 - OE^2 - OF^2 = AF^2 + BD^2 + CE^2$$

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14. In the figure given below O is a point in the interior of a triangle ABC , OD $\perp$ BC ,OE $\perp$ AC and $OF \perp AB$. Show that

$$AF^2 + BD^2 + CE^2 = AE^2 + CD^2 + BF^2$$

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15. A ladder 10m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

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16. A guy wire attached to a vertical pole of height 18m is 24m long and has a stake attached to the other end. How far from the base of the pole should the stake be driven so that the wire will be taut?

▶ **Watch Video Solution**

17. An aeroplane leaves an airport and flies due north at a speed of 1000 km per hour. At the same tune, another aeroplane leaves the same airport and flies due west at a speed of 1200 km per hour. |How far apart will be the two planes after 1`1/2

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18. Two poles of heights 6 m and 11m stand on a plane ground. If the distance between the feet of the poles is 12 m, find the distance between their tops.

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19. D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C. Prove that $AE^2 + BD^2 = AB^2 + DE^2$.

20. The perpendicular from A on side BC of a ABC intersects BC at D such that DB = 3 CD. Prove that $2AB^2 = 2AC^2 + BC^2$.

21. In an equilateral triangle ABC, D is a point on side BC such that $BD = \frac{1}{3}BC.$ Prove that $9AD^2 = 7AB^2$.

22. In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

23. Tick the correct answer and justify : In $\triangle PQR$, PQ = $6\sqrt{3}$ cm , PR =12 cm and QR = 6 cm. The angle Q is :
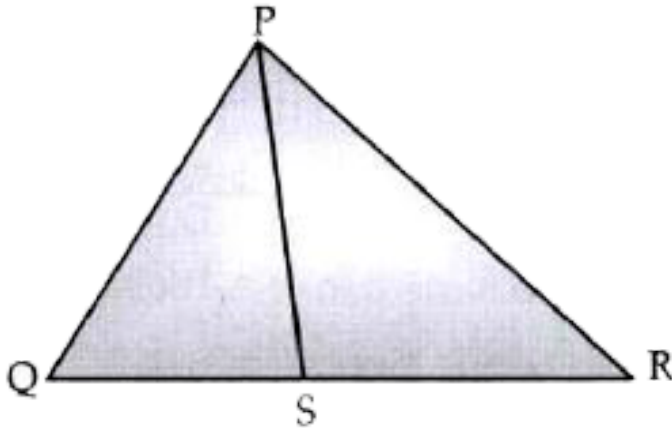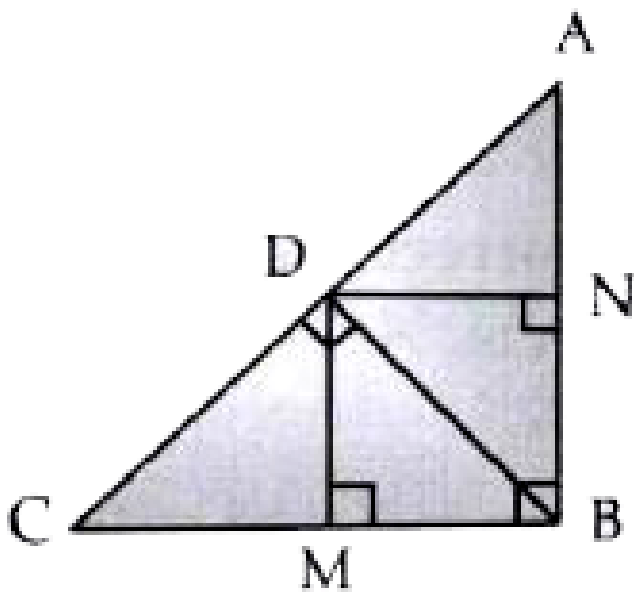
A. $120°$

B. $60°$

C. $90°$

D. $45°$

Answer: C

1. In the figure given below PS is the bisector of $\angle QPR$ of ΔPQR . Prove that $\dfrac{QS}{SR} = \dfrac{PQ}{PR}$.

2. In the figure given below D is a point on hypotenuse AC of ΔABC such that BD $\perp$ AC DM $\perp$ BC and DN $\perp$ AB .Prove that :
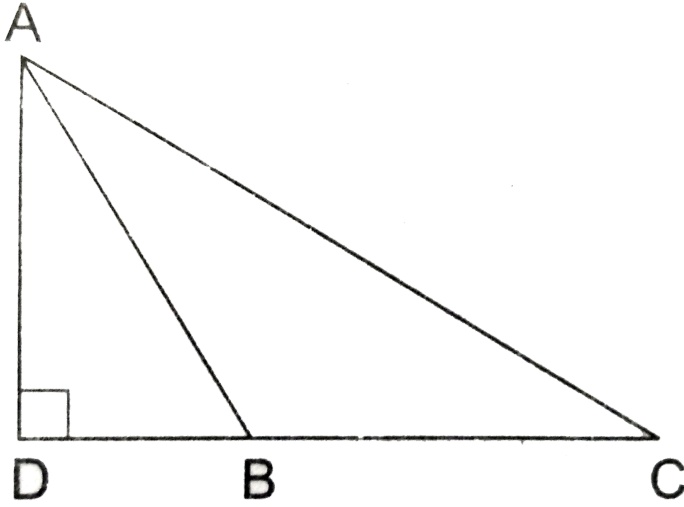
(i) $DM^2 = DN \times MC$ (ii) $DN^2 = DM \times AN$

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3. In the given figure, $\triangle ABC$ is an obtuse triangle, obtuse-angled at B. If $AD \perp CB$ (produced) prot that
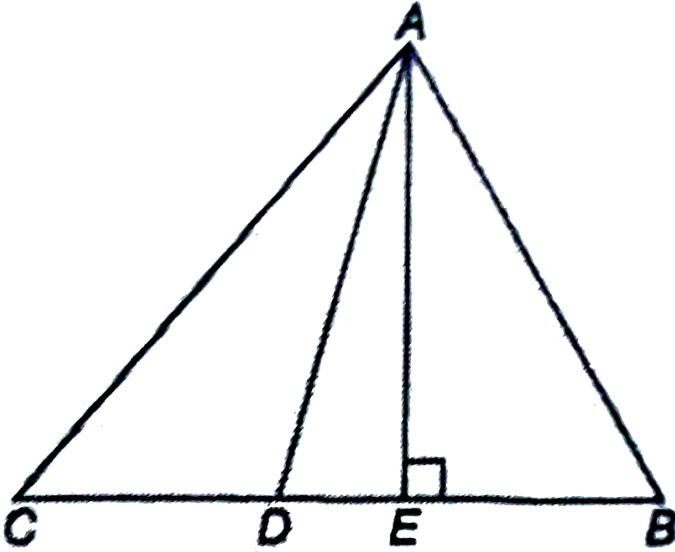
$$AC^2 = AB^2 + BC^2 + 2BC \cdot BD$$

4. (Result on acute triangle) In Fig. 4.184, $\angle B$ of ABC is an acute angle and $AD \perp BC$, prove that $AC^2 = AB^2 + BC^2 - 2\,BC \times BD$

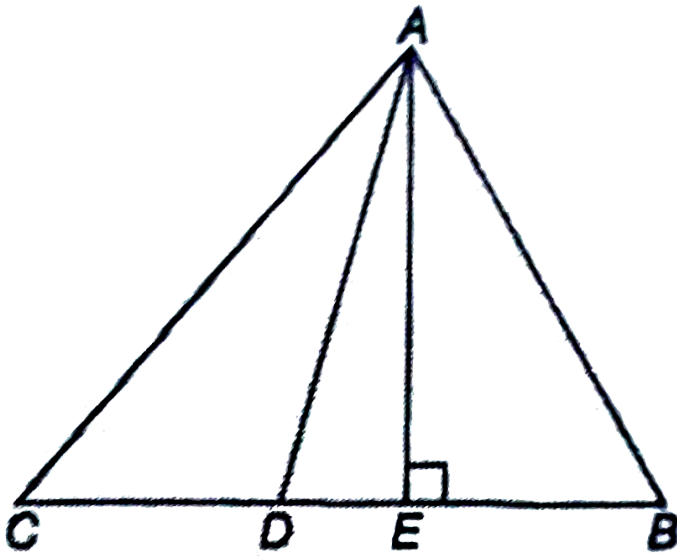**5.** The following figure shows a triangle ABC in which AD is a median and $AE \perp BC$. Prove that $2AB^2 + 2AC^2 = 4AD^2 + BC^2$.

6. The following figure shows a triangle ABC in which AD is a median and $AE \perp BC$. Prove that $2AB^2 + 2AC^2 = 4AD^2 + BC^2$.
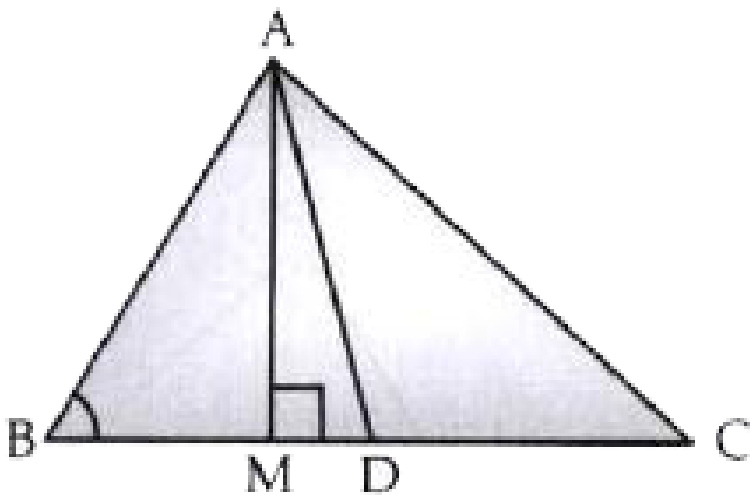
7. In the figure given below AD is a median of a triangle ABC and AM

$\perp$ BC . Prove that:

$$AC^2 + AB^2 = 2AD^2 + \frac{1}{2}BC^2$$

> ▶ **Watch Video Solution**

8. Prove that the sum of the squares of the diagonals of parallelogram is equal to the sum of the squares of its sides.

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9. In Figure, two chords AB and CD intersect each other at the point P. Prove that: (i) $\triangle APC \triangle DPB$ (ii) $AP \cdot PB = CP \cdot DP$

10. In Figure two chords AB and CD of a circle intersect each other at the point P (when produced) outside the circle. Prove that(i) $\Delta PAC \Delta PDB$ (ii) $PA\dot PB = PC\dot PD$

11. In figure D is a point on side BC of a ΔABC such that $\dfrac{BD}{CD} = \dfrac{AB}{AC}$. Prove that AD is the bisector of $\angle BAC$.

12. Nazinia is fly fishing in a stream. The tip of her fishing rod is 1.8 m above the surface of the water and the fly at the end of the string

rests on the water 3.6 m away and 2.4 m from a point directly under the tip of the rod. Assuming that h

Ncert Exemplar Exercise 6 1

1. In the figure given below $\angle BAC = 90°$ and AD $\perp$ BC. Then
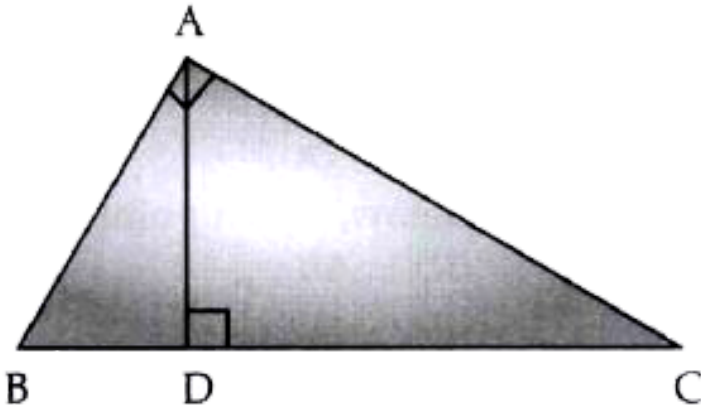
A. $BC \times CD = AC^2$

B. $AB \times AC = BC^2$

C. $BD \times CD = AD^2$

D. $AB \times AC = AD^2$

Answer: A

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2. The lengths of the diagonals of a rhombus are 16 cm and 12 cm.

Then, the length of the side of the rhombus is

A. 9 cm

B. 10 cm

C. 9 cm

D. 20 cm

Answer: B

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3. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?

A. $BC \times EF = AC \times FD$

B. $AB \times EF = AC \times DE$

C. $BC \times DE = AB \times EF$

D. $BC \times DE = AB \times FD$

Answer: C

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4. If in two $\triangle ABC$ and $\triangle PQR$, $\dfrac{AB}{QR} = \dfrac{BC}{PR} = \dfrac{CA}{PQ}$, then

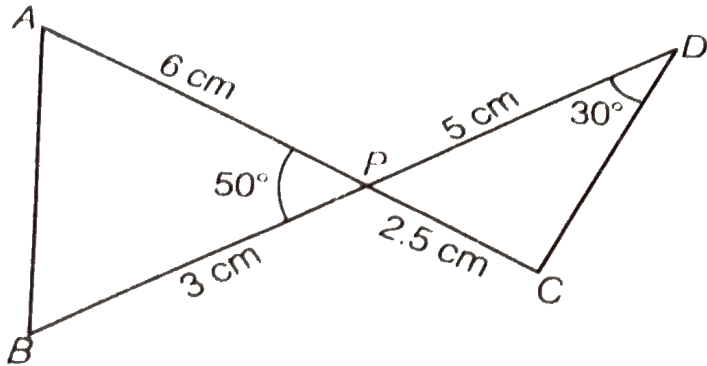A. $\triangle PQR \sim \triangle CAB$

B. $\triangle PQR \sim \triangle ABC$

C. $\triangle CBA \sim \triangle PQR$

D. $\triangle BCA \sim \triangle PQR$

Answer: A

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5. In figure, two line segments AC and BD intersects each other at the point P such that PA = 6 cm, PB = 3 cm, PC = 2.5 cm, PD=5 cm, $\angle APB = 50°$ and $\angle CDP = 30°$. Then, $\angle PBA$ is equal to

A. $50°$

B. $30°$

C. $60°$

D. $100°$

Answer: D

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6. In $\triangle DEF$ and $\triangle PQR,$ it is given that $\angle D = \angle Q$ and $\angle R = \angle E,$ then which of the following is not true?

A. $\dfrac{EF}{PR} = \dfrac{DF}{PQ}$

B. $\dfrac{DE}{PQ} = \dfrac{FE}{RP}$

C. $\dfrac{DE}{QR} = \dfrac{DF}{PQ}$

D. $\dfrac{EF}{RP} = \dfrac{DE}{QR}$

Answer: B

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7. In $\triangle ABC$ and $\triangle DEF$, $\angle B = \angle E$, $\angle F = \angle C$ and AB=3DE. Then, the two triangles are

A. congruent but not similar

B. similar but not congruent

C. neither congruent nor similar

D. congruent as well as similar

Answer: B

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8. If $\triangle ABC \sim \triangle PQR$ with $\dfrac{BC}{QR} = \dfrac{1}{3}$, then $\dfrac{ar(\triangle PRQ)}{ar(\triangle BCA)}$ is equal to

A. 9

B. 3

C. $\dfrac{1}{3}$

D. $\dfrac{1}{9}$

Answer: A

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9. If $\Delta ABC \sim \Delta DFE$, $\angle A = 30$, $\angle C = 50°$,AB=5 cm,AC=8 cm and DF=7.5 cm. Then, which of the following is true?

A. DE =12 cm $\angle F = 50°$

B. $DE = 12cm$, $\angle F = 100°$

C. E =12 cm $\angle D = 100°$

D. EF =12 cm, $\angle D = 30°$

Answer: B

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10. If in $\triangle ABC$ and $\triangle DEF$, $\dfrac{AB}{DE} = \dfrac{BC}{FD}$, then they will be similar, when

A. $\angle B = \angle E$

B. $\angle A = \angle D$

C. $\angle B = \angle D$

D. $\angle A = \angle F$

Answer: C

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11. If $\triangle ABC \sim \triangle QRP$, $\dfrac{ar(\triangle ABC)}{ar(\triangle PQR)} = \dfrac{9}{4}$, AB=18 cm and BC=15 cm, then PR is equal to

A. 10 cm

B. 12 cm

C. $\dfrac{20}{3}$ cm

D. 8 cm

Answer: A

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12. If S is a point on side PQ of a $\triangle PQR$ such that PS=QS=RS, then

A. $PR \times QR = RS^2$

B. $QS^2 + RS^2 = QR^2$

C. $PR^2 + QR^2 = PQ^2$

D. $PS^2 + RS^2 = PR^2$

Answer: C

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1. Is the triangle with sides 25 cm, 5 cm and 24 cm a right triangle?

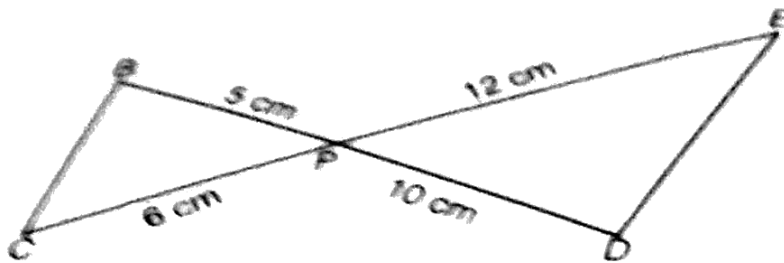Give reason for your answer.

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2. It is given that $\Delta DEF \sim \Delta RPQ$. Is it true to say that $\angle D = \angle R$

and $\angle F = \angle P$? Why?

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3. A and B are respectively the points on the sides PQ and PR of a

ΔPQR such that PQ =12.5 cm, PA= 5 cm, BR = 6 cm and PB = 4 cm. Is

AB $\|$ QR? Give reason for your answer.

4. In figure BD and CE intersect each other at the point P. Is $\triangle PBC \sim \triangle PDE$? Why?

5. In $\triangle PQR$ and $\triangle MST$, $\angle P = 55°$, $\angle Q = 25°$, $\angle M = 100°$ and $\angle S = 25°$. Is $\triangle QPR \sim \triangle TSM$? Why ?

6. Is the following statement true? Why? "Two quadrilaterals are similar, if their corresponding angles are equal".

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7. Two sides and the perimeter of one triangle are respectively three times the corresponding sides and the perimeter of the other triangle. Are the two triangles similar? Why?

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8. If in two right triangles, one of the acute angles of one triangle is equal to an acute angle of the other triangle. Can you say that two triangles will be similar? Why?

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9. The ratio of the corresponding altitudes of two similar triangles is $\dfrac{3}{5}$. Is it correct to say that ratio of their areas is $\dfrac{6}{5}$? Why?

10. D is a point on side QR of ΔPQR such that PD $\perp$ QR. Will it be correct to say that $\Delta PQD \sim \Delta RPD$? Why?

11. In figure, if $\angle D = \angle C$, then it is true that $\Delta ADE \sim \Delta ACB$? Why?

12. Is it true to say that, if in two triangles, an angle of one triangle is equal to an angle of another triangle and two sides of one triangle are proportional to the two sides of the other triangle, then the triangles are similar? Give reason for your answer.
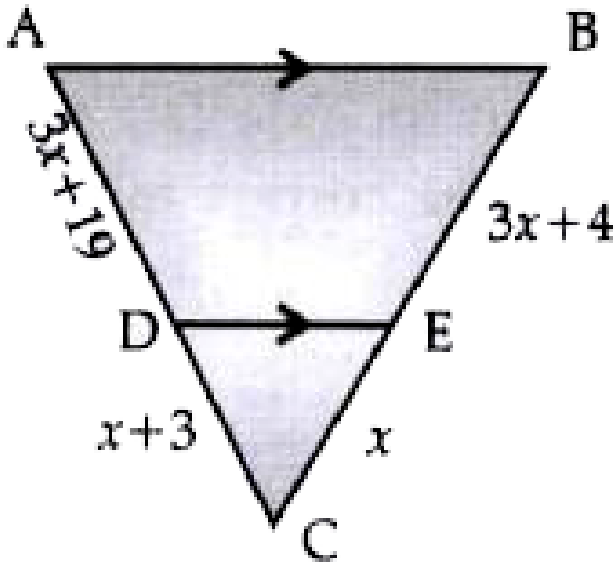
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1. In PQR, $QM \perp PR$ and $PR^2 - PQ^2 = QR^2$. Prove that $QM^2 = PM \times MR$

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2. Find the value of x for which DE ||AB in the given figure.
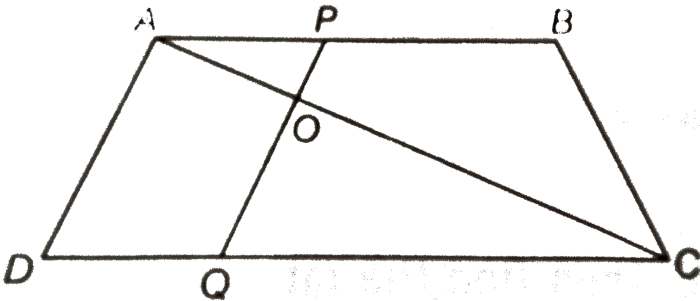
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3. In figure, if $\angle 1 = \angle 2$ and $\triangle NSQ = \triangle MTR$, then prove that $\triangle PTS \sim \triangle PRQ$.

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4. Diagonals of a trapezium PQRS intersect each other at the point 0 ,PQ||RS and PQ=3 RS. Find the ratio of the areas of ΔPOQ and ΔROS.

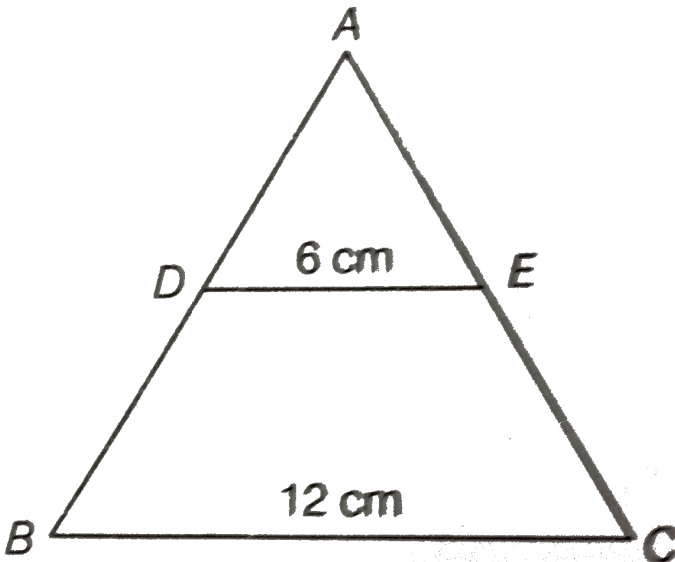**5.** In figure , if $AB||DC$ and AC, PQ intersect each other at the point O. Prove that OA.CQ=OC.AP.

6. Find the altitude of an equilateral triangle of side 8 cm.

7. If $\triangle ABC \sim \triangle DEF$ AB =4 cm , DE = 6 cm, EF =9 cm and FD =12 cm

find the perimeter of $\triangle ABC$.

8. In figure, if DE||BC, then find the ratio of ar ($\triangle ADE$) and

ar(DECB).

9. ABCD is a trapezium in which AB||DC and P,Q are points on AD and BC respectively, such that PQ||DC, if PD=18 cm, BQ=35 cm and QC=15 cm. Find AD.

10. Corresponding sides of two similar triangle are in the ratio of 2:3 . If the are of the smaller triangle is 48 cm^2 find the area of the larger triangle .
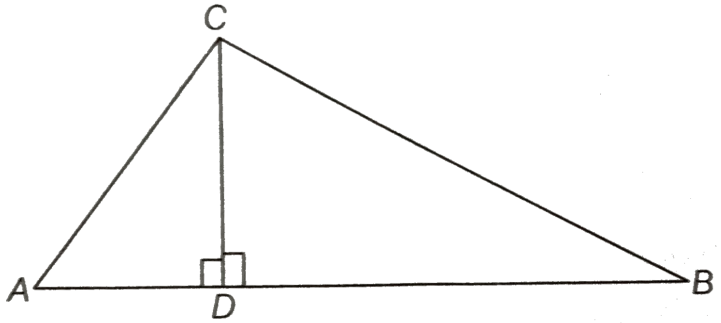
11. In a ΔPQR, N is a point on PR, such that QN $\perp$ PR. If PN $\cdot$ NR= QN^2, then prove that $\angle PQR = 90°$.

12. Areas of two similar triangles are 36 cm^2 and 100 cm^2 . If the length of a side of the larger triangle is 20 cm find the length of the corresponding side of the smaller triangle.

13. In given figure, if $\angle ACB = \angle CDA$, $AC = 8cm$ and $AD = 3cm$

, then find BD.

14. A 15 high tower casts a sshadow 24 long at a certain time at the same time, a telephone pole casts a shadow 16 long. Find the height of the telephone pole.
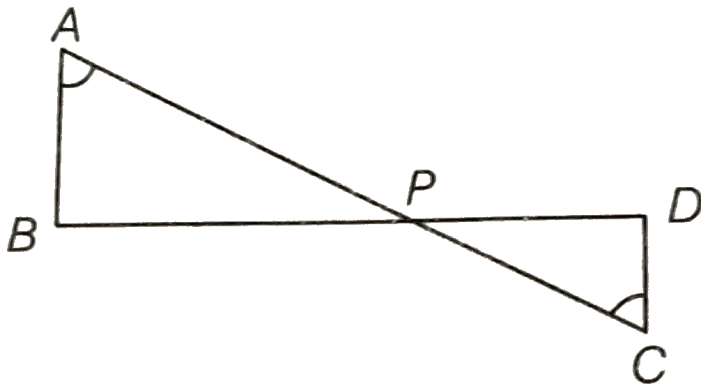
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15. Foot of a 10 m long ladder leaning against a verticle wall is 6 m away from the base of the wall. Find the height of the point on the wall where the top of the ladder reaches.

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Ncert Exemplar Exercise 6 4

1. In given figure, if $\angle A = \angle C$, AB= 6 cm, BP = 15 cm, AP = 12 cm and CP= 4 cm, then find the lengths of PD and CD.

2. It is given that $\triangle ABC \sim \triangle EDF$ such that AB=5 cm, AC=7 cm, DF= 15 cm and DE = 12 cm. Find the lengths of the remaining sides of the triangles.

3. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

4. In the figure given below if PQRS is a parallelogram and AB |PS then prove that OC ||SR.
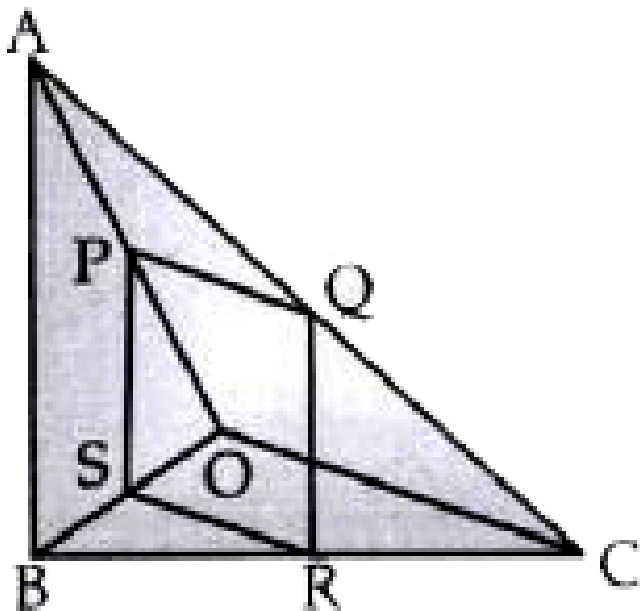
5. A 5 m long ladder is placed leaning towards a vertical wall such that it reaches the wall such that it reaches the wall at a point 4 m high. If the foot of the ladder is moved 1.6 m towards the wall, then find the distance by which the top of the ladder would slide upwards on teh wall.

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6. For going to a city B from city A there is a route via city C such that $AC \perp CB$, AC =2x km and CB = 2(x + 7) km. It is proposed to construct a 26 km highway which directly connects the two cities A and B. Find how much distance will be saved in reaching city B from city A after the construction of the highway.
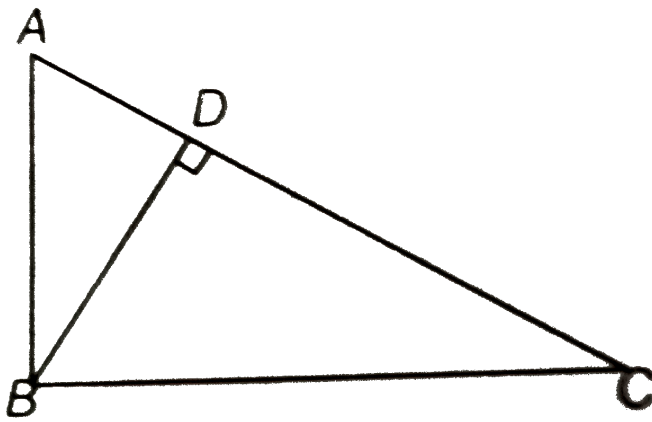
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7. A flag pole 18 m high casts a shadow 9.6 m long. Find the distance of the top of the pole from the far end of the shadow.

8. A street light bulb is fixed on a pole 6 m above the level of the street. If a women of height 1.5 m casts a shadow of 3 m, then find how far she is away from the base of the pole.
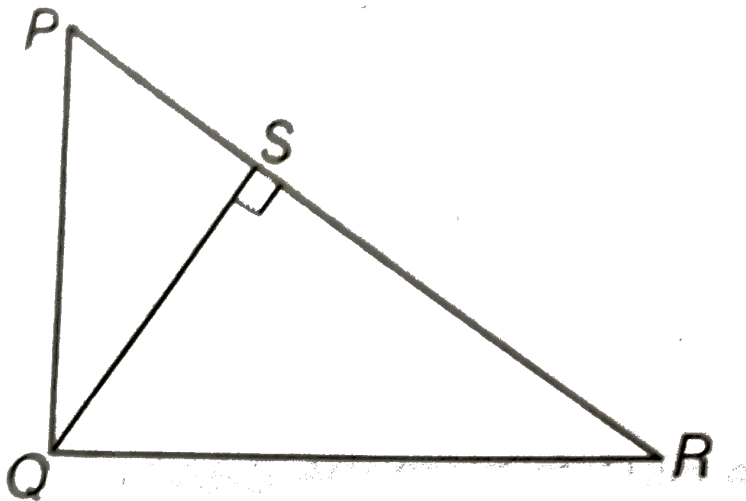
9. In given figure, ABC is a triangle right angled at B and BD ⊥ AC. If AD=4 cm and CD= 5 cm, then find BD and AB.

10. In given figure PQR is a right angled triangle, right angled at Q and QS ⊥ PR. If PQ=6 cm and PS=4cm, then find QS, RS and QR.

11. Ii ΔPQR, PD $\perp$ QR such that D lies on QR, if PQ=a,PR=b,QD=c and DR=d, then prove that (a+b)(a-b)=(c+d)(c-d).

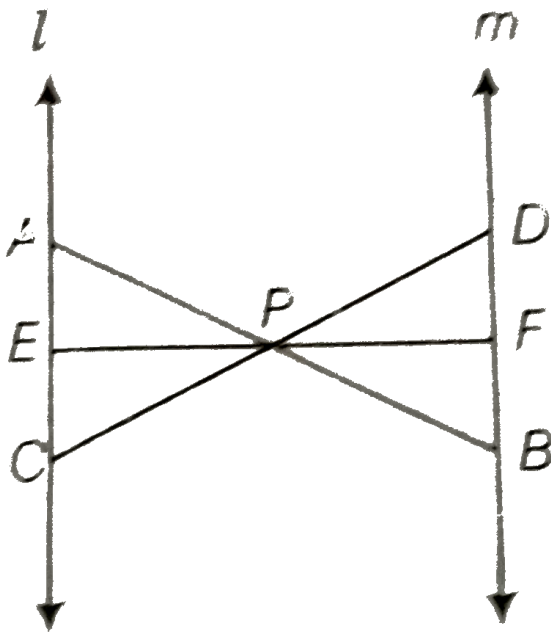**12.** In a quadrilateral ABCD, $\angle A + \angle D = 90°$. Prove that

$$AC^2 + BD^2 = AD^2 + BC^2$$

13. In given figure,l||m and liner segments AB, CD and EF are concurrent at point P. Prove that $\dfrac{AE}{BF} = \dfrac{AC}{BD} = \dfrac{CE}{FD}$

14. 14 In Fig. 6.21, PA, QB Rc and SD are all perpendiculars to a line l, AB 6 cm, Bc 9 cm, CD g cm and SP 36 om Find PO, QR an RS. Fig. 6.21
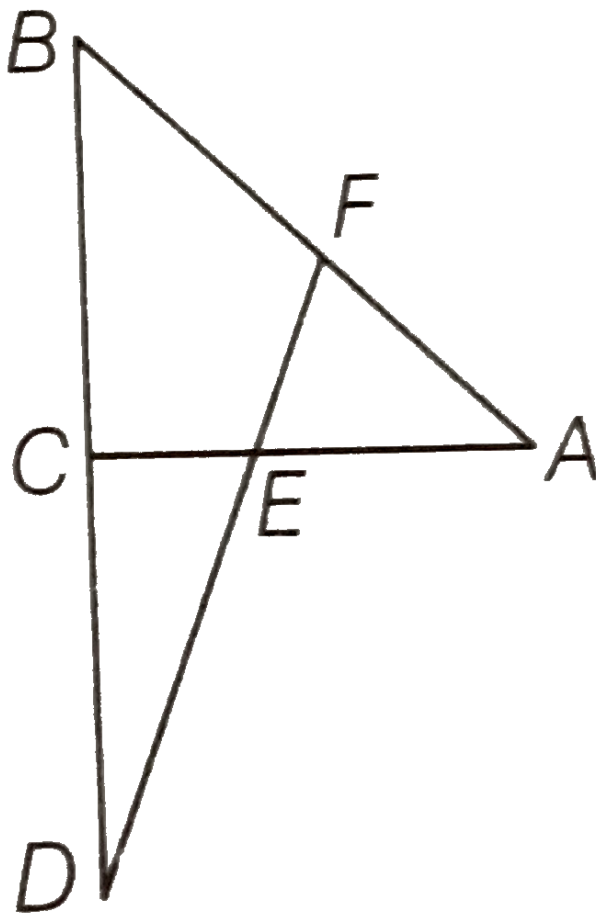
15. O is the point of intersection of the diagonals AC and BD of a trapezium ABCD with AB∥DC. Through O , aline segment PQ is drawn parallel to AB meeting AD in P and BC in Q, prove that PO=QO.

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16. In figure, line segment DF intersects the side AC of a $\triangle ABC$ at the point E such that E is the mid-point of CA and $\angle AEF - \angle AFE$.

Prove that $\dfrac{BD}{CD} = \dfrac{BF}{CE}$

17. Prove that the area of the semicircle drawn on the hypotenuse of

a right angled triangle is equal to the sum of the areas of the

semicircles drawn on the other two sides of the triangle

18. Prove that the area of the equilateral triangle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles drawn on the other two sides of the triangle.
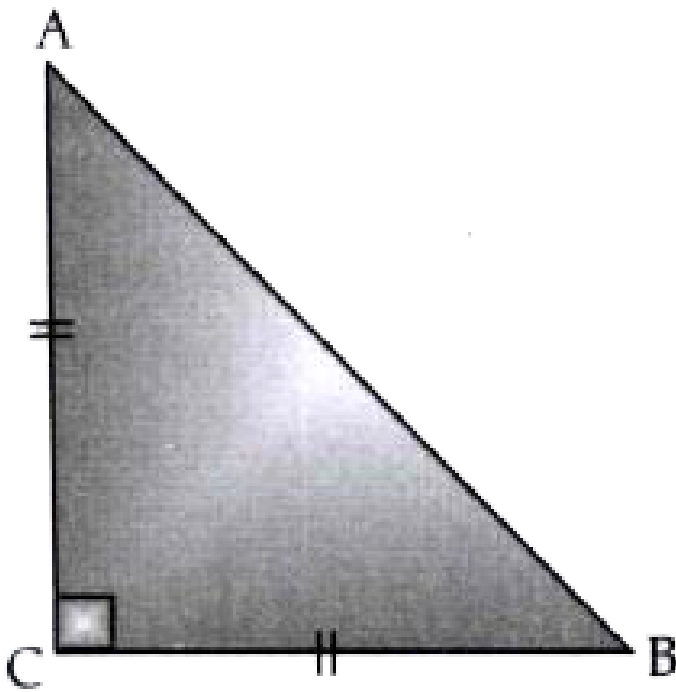
Board Corner Very Short Answer Type Question 1 Mark Each

1. In Figure 1 DE|| BC ,AD = 1 cm and BD =2 cm . What is the ratio of the ar (ΔABC) to the $ar(\Delta ADE)$?
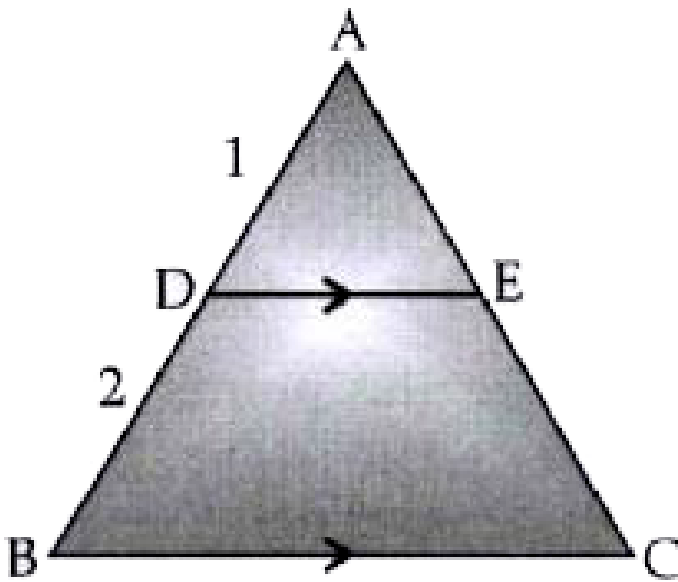
2. In figure below ABC is an isosceles triangle right at C with AC =4 cm . Find the length of AB .

3. In Figure below DE||BC . Find the length of side AD given that AE

=1.8 cm BD = 7.2 cm and CE = 5.4 cm.
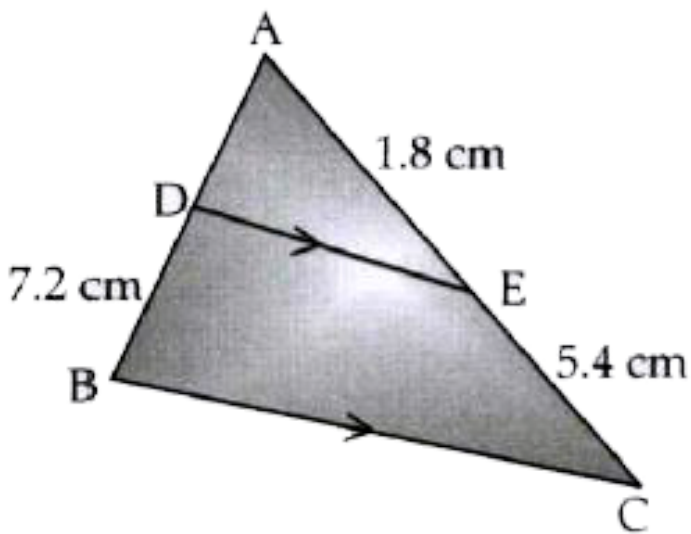
4. Given $\triangle ABC \backsim \triangle PQR$ if $\dfrac{AB}{PQ} = \dfrac{1}{3}$ then find $\dfrac{ar \triangle ABC}{ar \triangle PQR}$

Board Corner Short Answer Type Question 3 Mark Each

1. In the given figure, $\angle ACB = 90°$ and $CD \perp AB$. Prove that

$CD^2 = BD \cdot AD$
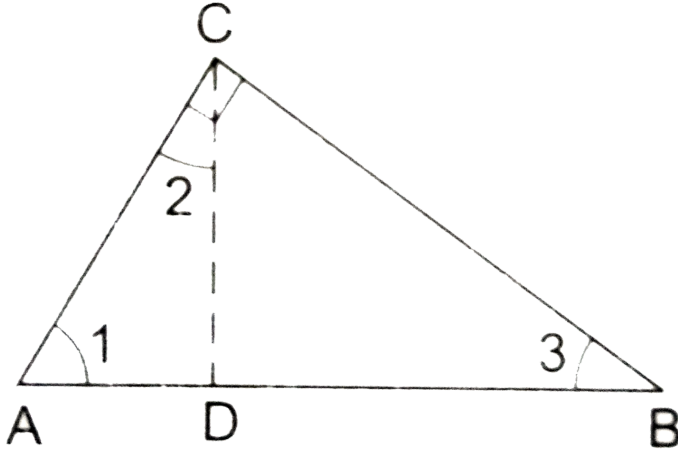
2. P and Q are points on the sides CA and CB respectively of

ABC , right angled at C . Prove that $AQ^2 + BP^2 = AB^2 + PQ^2$.

3. Two right triangles ABC and DBC are drawn on the same hypotenues BC on the same side of BC. If AC and DB intersects at P, then :
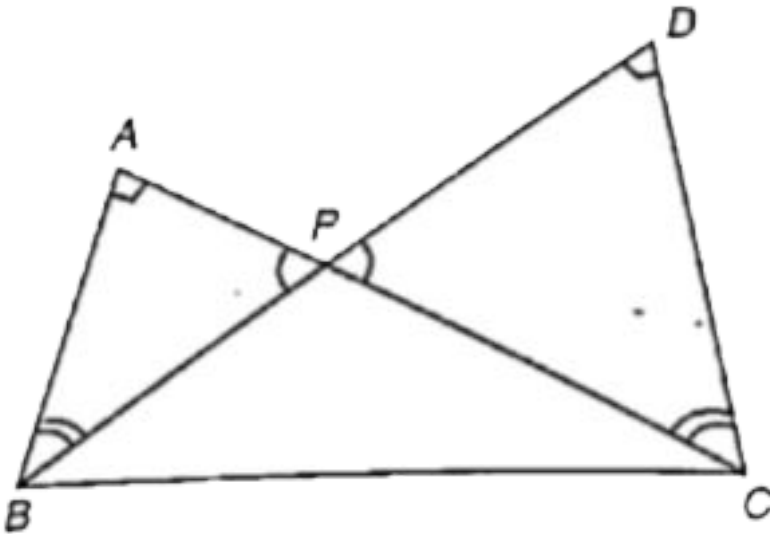
4. Diagonals of a trapezium PQRS intersect each other at the point O ,PQ||RS and PQ=3 RS. Find the ratio of the areas of $\triangle POQ$ and $\triangle ROS$.

5. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

6. If the areas of two similar triangles are equal, prove that they are congruent.

Board Corner Long Short Answer Type Question 4 Mark Each

1. Theorem 6.9 : In a triangle, if square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.

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2. Theorem 6.8 : In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

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3. Theorem 6.6 : The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

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4. In an equilateral triangle ABC, D is a point on side BC such that $BD = \dfrac{1}{3}BC.$ Prove that $9AD^2 = 7AB^2$.

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Multiple Choice Questions

1. In ΔPQR, if PS is the internal bisector of $\angle P$ meeting OR at S and PQ = 15 cm, QS = (3 + x) cm, SR = (x -3) cm and PR =7 cm, then find the value of x.
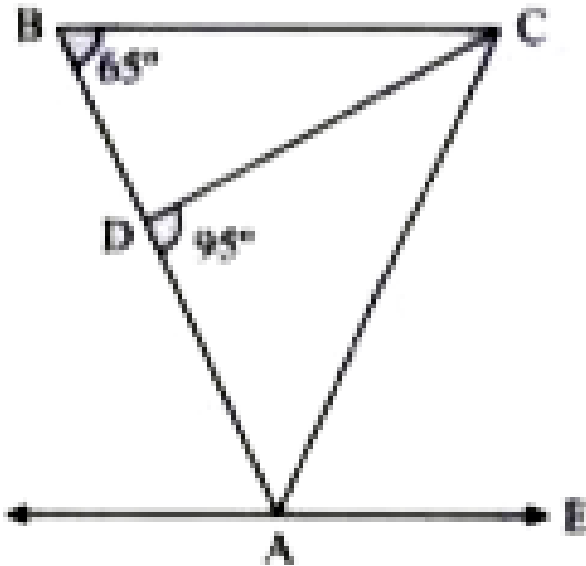
    A. 2.85 cm

    B. 8.25 cm

    C. 5.28 cm

    D. 8.52 cm

Answer: B

2. In the figure given below, ABC is a triangle. BC is parallel to AE. If BC = AC, then what is the value of $\angle CAE$?
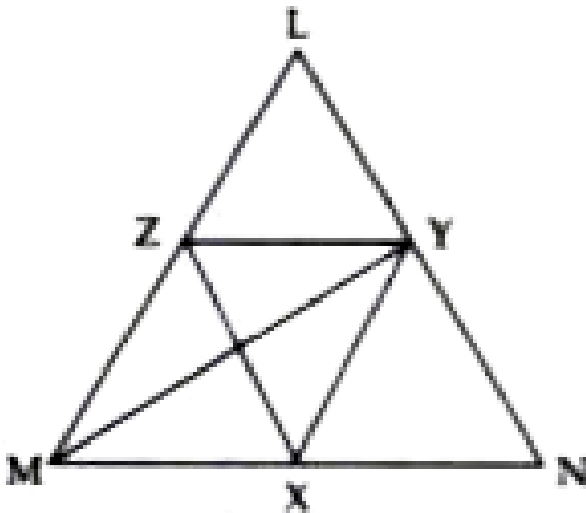

A. $20°$

B. $30°$

C. $40°$

D. $50°$

Answer: D

3. In the figure given below, YZ is parallel to MN, XY is parallel to LM and XZ is parallel to LN. Then MY is:

A. The median of ΔLMN

B. The angular bisector of $\angle LMN$

C. Perpendicular to LN

D. Perpendicular bisector of LN

Answer: A

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4. The lengths of three sides (in cm) of a triangle aa Which one of the following cases is not suitable to be the three sides of a triangle?
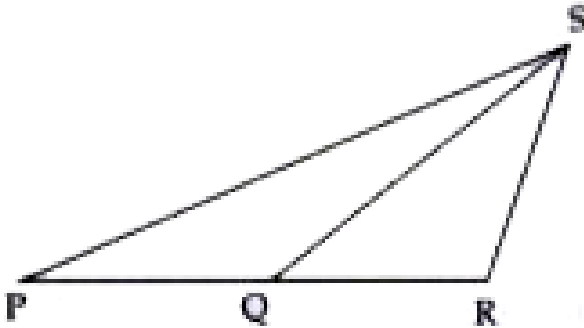
A. 2, 3, 4

B. 2, 3, 5

C. 2, 4, 5

D. 3, 4, 5

Answer: B

5. In the figure given below, PQ = QS and QR = RS. If $\angle SRQ = 100°$, then find the angle of $\angle QPS$?

A. $40°$

B. $30°$

C. $20°$

D. $15°$

Answer: C

6. In the given figure, QR is parallel to AB and DR is parallel to QB.

What is the number of distinct pairs of similar triangles?

A. 1

B. 2

C. 3

D. 4
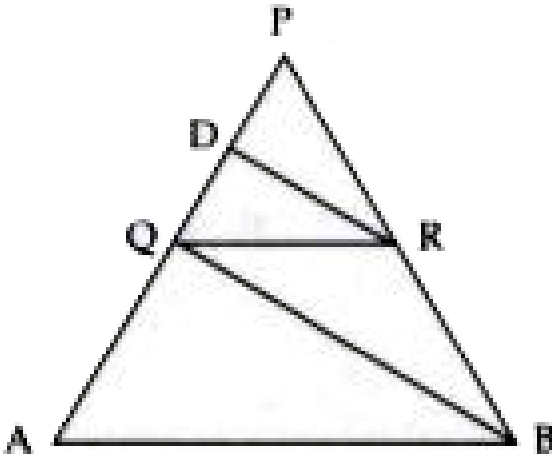
Answer: B

7. The vertical angle of an isosceles triangle is $15°$ more than each

of its base angles. What is the vertical angle?

A. $35°$

B. $55°$

C. $65°$

D. $70°$

Answer: D

8. In $\triangle ABC$, D and E are points on sides AB and AC, such that DE ||

BC. If AD = x, DB = x - 2, AE = x + 2 and EC = x - 1, then the value of x is:

A. 4

B. 2

C. 1

D. 8

Answer: A

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9. In $\triangle ABC$, the angle bisector of $\angle A$ cuts BC at E. Find the length

of AC, if lengths of AB, BE and EC are 9 cm, 3.6 cm and 2.4 cm?
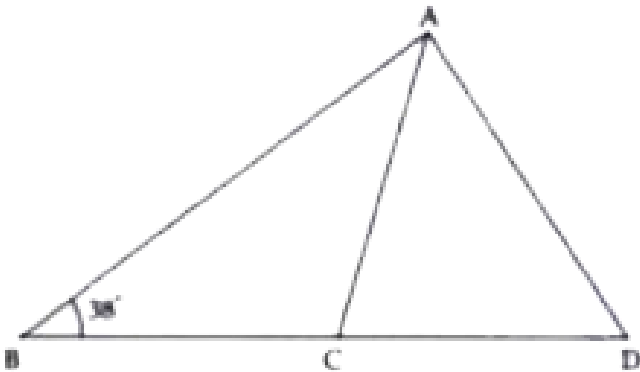
A. 5.4cm

B. 8cm

C. 4.8 cm

D. 6cm

Answer: D

10. In the given figure, if $\angle B = 38°$, AC = BC and AD =CD, then $\angle D$

equals to:

A. $26°$

B. $28°$

C. $38°$

D. $52°$

Answer: B

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11. If the areas of two similar triangles are equal, then these triangles are ....
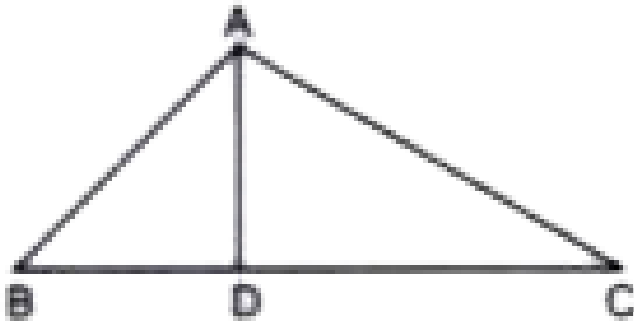
A. congruent

B. equilateral

C. equivalent

D. none of these

Answer: A

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12. In Fig. $\angle BAC = 90°$ and $AD \perp BC$. Then,

A. $BD . CD = BC^2$

B. $AB . AC = BC^2$

C. $BD . CD = AD^2$

D. $AB . AC = AD^2$

Answer: C

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13. If $\triangle ABC \sim \triangle EDF$ and $\triangle ABC$ is not similar to $\triangle DEF$, then which of the following is not true?

A. $BC.\,EF = AC.\,FD$

B. $AB.\,EF = AC.\,DE$

C. $BC.\,DE = AB.\,EF$
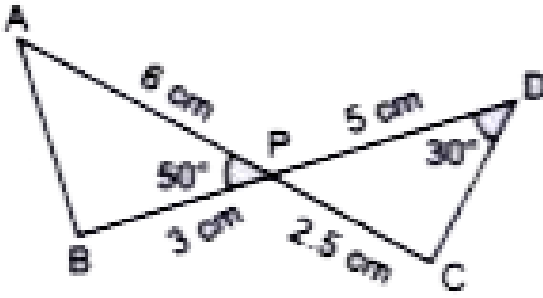
D. $BC.\,DE = AB.\,FD$

Answer: B

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14. In Fig., two line segments, AC and BD intersect each other at the point P such that PA = 6 cm, PB= 3 cm, PC = 2.5 cm, PD = 5 cm,

$\angle APB = 50°$ and $\angle CDP = 30°$. Then $\angle PBA$ is equal to :

A. $30°$

B. $60°$

C. $80°$

D. $100°$

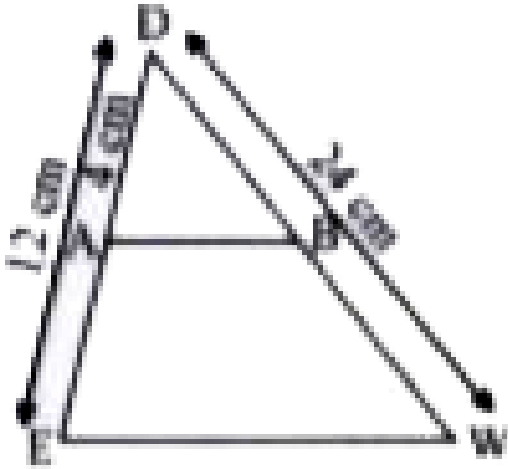**Answer: D**

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Very Short Answer Type Questions

1. In $\triangle DEW$, AB || EW. If AD = 4 cm, DE = 12 cm and DW = 24 cm, then find the value of DB.

2. In a right triangle ABC, right-angled at B, BC = 12 cm and AB = 5 cm. Find the radius of the circle inscribed in the triangle.
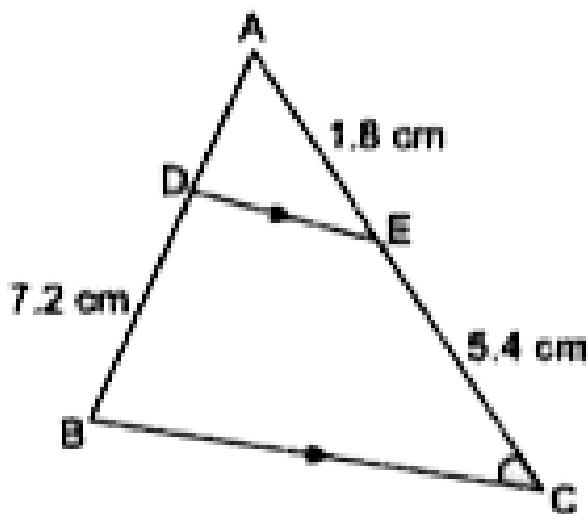
3. In $\triangle ABC$, D and E are mid-points of AC and BC respectively such that DE $\parallel$ AB. If $AD = 2x$, $BE = 2x - 1$, $CD = x + 1$ and $CE = x - 1$, then find the value of x.

4. In figure, DE || BC, Find the length of side AD, given that AE = 1.8 cm, BD = 7.2 cm and CE = 5.4 cm.

5. A vertical tree of 12 m long casts a shadow 8 m long on the ground. At the same time, a tower casts the shadow 40 m long on the ground. Determine the height of the tower.

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6. A girl of height 90 cm is walking away from the base of a lamp-post at a speed of 1.2 m/s. If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds.

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7. In $\triangle ABC$, AD is the bisector of $\angle A$. If AB=5.6 cm, BD=3.2 cm and BC = 6 cm, find AC.

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8. The perimeters of two similar triangles are 25 cm and 15 cm respectively. If one side of the first triangle is 9 cm, find the corresponding side of the second triangle.

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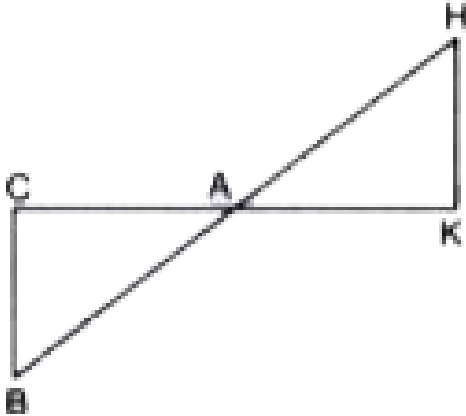**9.** In $\triangle ABC$, D and E are points on AB and AC respectively such that DE ‖ BC. If AD = 2.4 cm, AE=3.2 cm, DE=2 cm and BC =5 am, find BD and CE.

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10. If $\triangle ABC$ and $\triangle BDE$ are equilateral triangles where D is the mid-point of BC, find the ratio of the area of $\triangle ABC$ and $\triangle BDE$.

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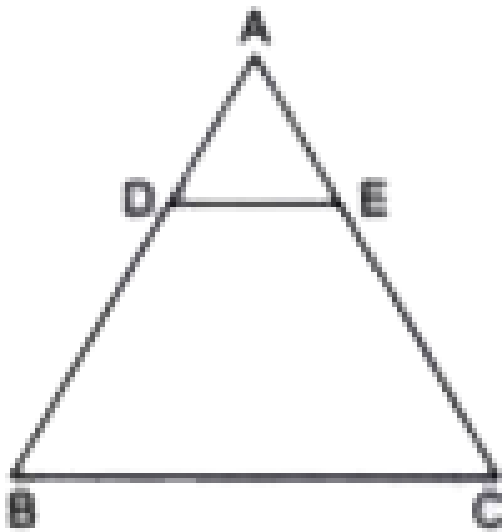**11.** In the given figure, $\triangle AHK$ is similar to $\triangle ABC$. If AK = 10 cm, BC =3.5 cm and HK =7 cm, find AC.

12. In the figure given below, DE || BC and $AD = \dfrac{1}{2}BD$. If BC = 4.5 cm, find DE.

Assertion And Reasoning Based Questions

1. Assertion: If in a $\triangle ABC$, a line DE ‖ BC, intersects AB in D and AC in E, then $\dfrac{AB}{AD} = \dfrac{AC}{AE}$.
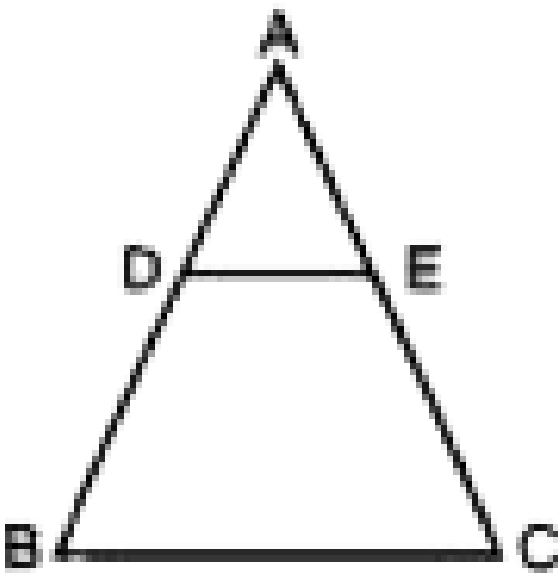
Reason: If a line is drawn parallel to one side of a triangle intersecting the other two sides, then the other two sides are divided in the same ratio.

A. Both the Assertion and the Reason are correct and the Reason

   is the correct explanation of the Assertion.

B. Both-the Assertion.and the Reason are.correct but the Reason

   is not the correct explanation of the Assertion.

C. Assertion is true but the Reason is false.

D. Assertion is false but the Reason is true.

Answer: A

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2. Assertion: ABC is an isosceles right triangle, right angled at C, then $AB^2 = 3AC^2$.

Reason: In an isosceles triangle ABC, if AC = BC and $AB^2 = 2AC^2$, then $\angle C = 90°$.

A. Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

B. Both the Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.

C. Assertion is true but the Reason is false.

D. Assertion is false but the Reason is true.

Answer: D

Case Based Questions

1. On one day, a poor girl is looking for a lamppost for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp post is 3.6 m above the ground and height of the girl is 90 cm (see below figure).
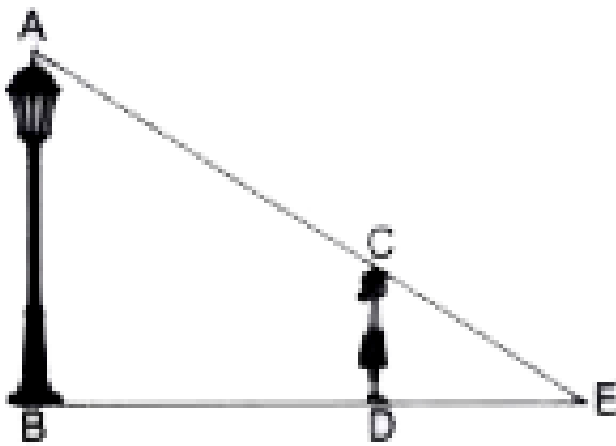
The distance of the girl from the base of the lamp post after 4 seconds:

A. 1.2

B. 3.6 m

C. 4.8 m

D. none of these

Answer: C

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2. On one day, a poor girl is looking for a lamppost for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp post is 3.6 m above the ground and height of the girl is 90 cm (see below figure).
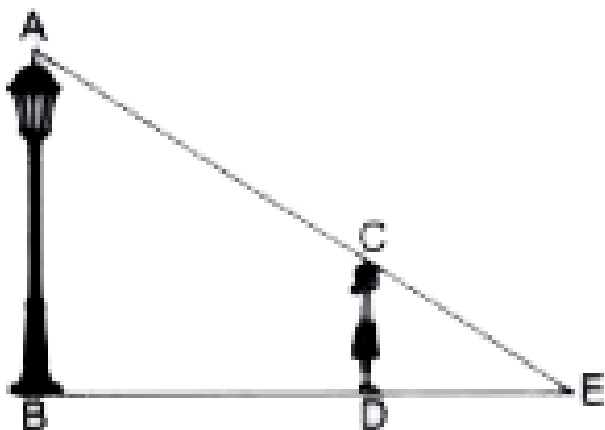

The correct similarity criteria appliable for triangles ABE and CDE is:

A. AA

B. SAS

C. SSS

D. AAS

Answer: A

3. On one day, a poor girl is looking for a lamppost for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp post is 3.6 m above the ground and height of the girl is 90 cm (see below figure).
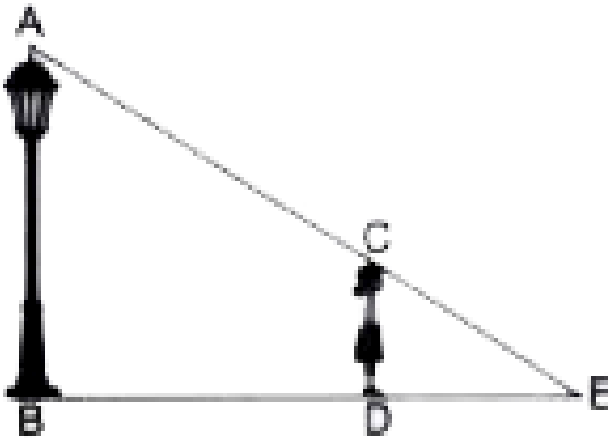

The length of her shadow after 4 seconds is:

A. 1.2 m

B. 3.6 m

C. 4.8 m

D. none of these

Answer: D

4. On one day, a poor girl is looking for a lamppost for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp post is 3.6 m above the ground and height of the girl is 90 cm (see below figure).

Sides of two similar triangles are in the ratio 9 : 16. The ratio of corresponding area of these triangles.
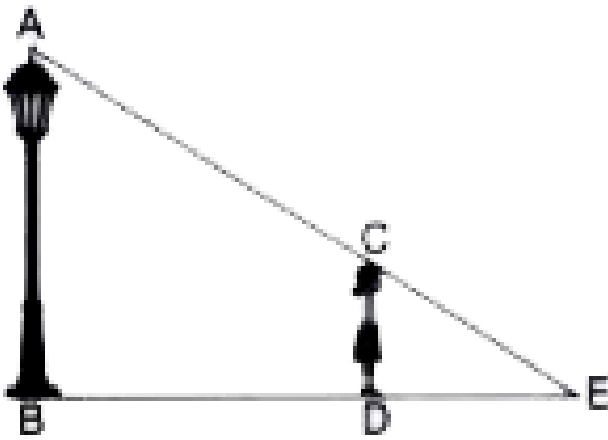
A. $9 : 16$

B. 3.4

C. $81 : 256$

D. $18 : 32$

Answer: C

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5. On one day, a poor girl is looking for a lamppost for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp post is 3.6 m above the ground and height of the girl is 90 cm (see below figure).
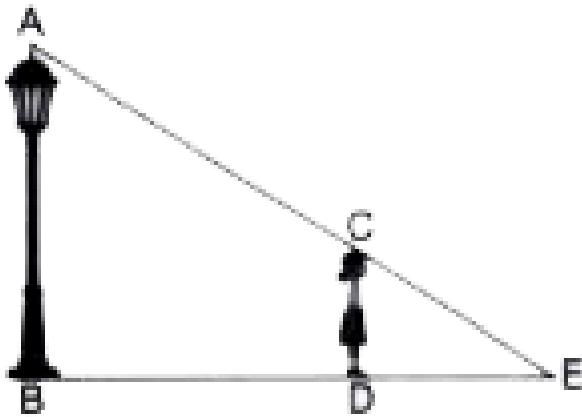

The ratio AC : CE. is:

A. $1:3$

B. $3:1$

C. $1:4$

D. $4:1$

Answer: B

6. Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut2 and that of hut-2 to mountain top is 3: 7.

What is the ratio of the perimeters of the triangle formed by both

hotels and mountain top to the triangle formed by both huts and mountain top?

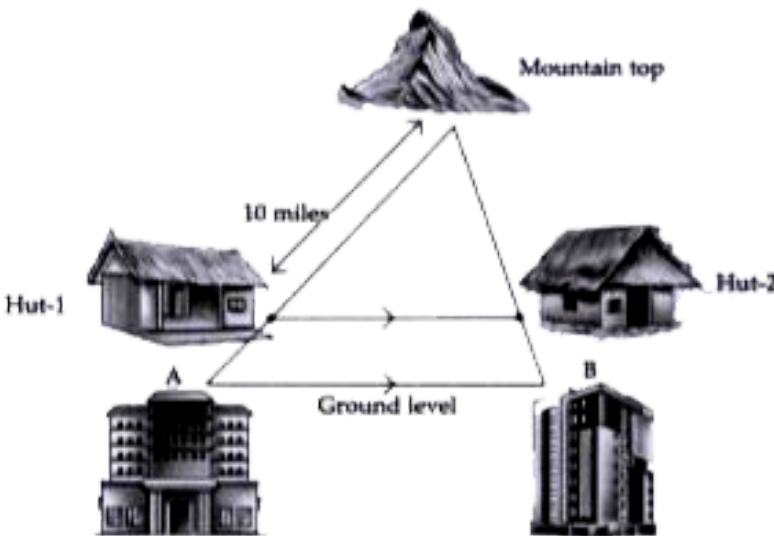A. $5 : 2$

B. $10 : 7$

C. $7 : 3$

D. $3 : 10$

Answer: B

▶ View Text Solution

7. Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut2 and that of hut-2 to mountain top is 3: 7.

Mountain top

10 miles

Hut-1

Hut-2

Ground level

A

B

If distance between hut-1 and mountain top is 10 miles, then the distance between the hotel A and hut-1 is:
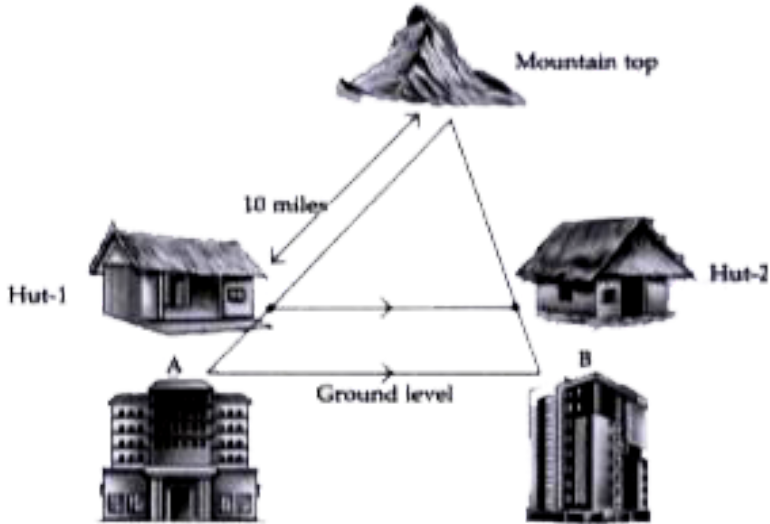
A. 2.5 miles

B. 29 miles

C. 4.29 miles

D. 1.5 miles

Answer: C

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8. Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut2 and that of hut-2 to mountain top is 3: 7.
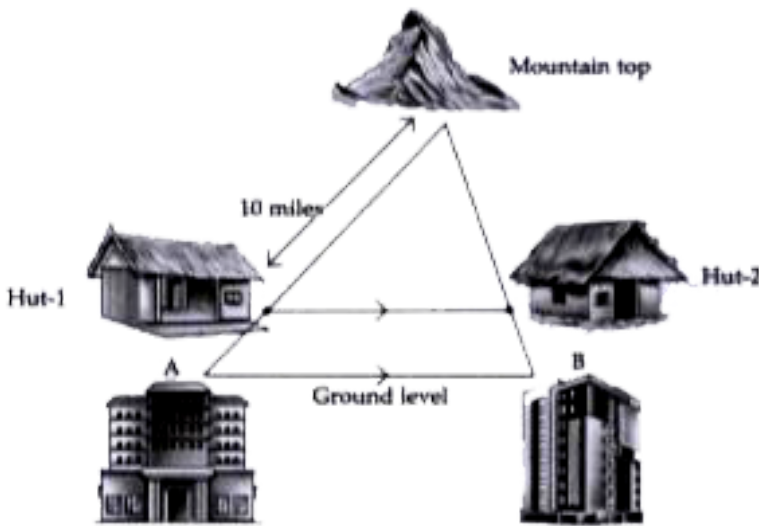

If the horizontal distance between the hut-1 and hut-2 is 8 miles, then the distance between the two hotels is:

A. 2.4 miles

B. 11.43 miles

C. 9 miles
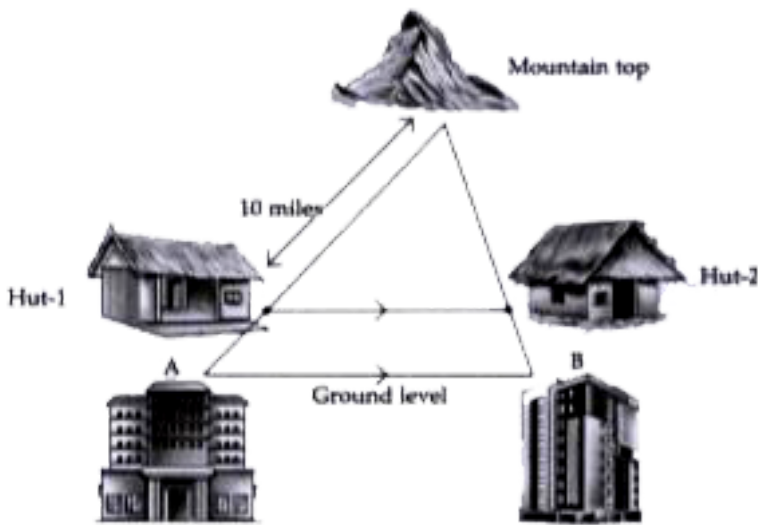
D. 7 miles

Answer: B

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9. Two hotels are at the ground level on either side of a mountain. On moving a certain distance towards the top of the mountain two huts are situated as shown in the figure. The ratio between the distance from hotel B to hut2 and that of hut-2 to mountain top is 3: 7.

Mountain top
10 miles
Hut-1
Hut-2
Ground level
A
B

If the distance from mountain top to hut-1 is 5 miles more than that of distance from hotel B to mountain top, then what is the distance between hut-2 and mountain top?

A. 3.5 miles

B. 6 miles

C. 5.5 miles

D. 4 miles

Answer: A

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10. In the backyard of house, Shikha has some empty space in the shape of a $\triangle PQR$. She decided to make it a garden. She divided the whole space into three parts by making boundaries AB and CD using bricks to grow flowers and vegetables where AB||CD||QR as shown in figure.
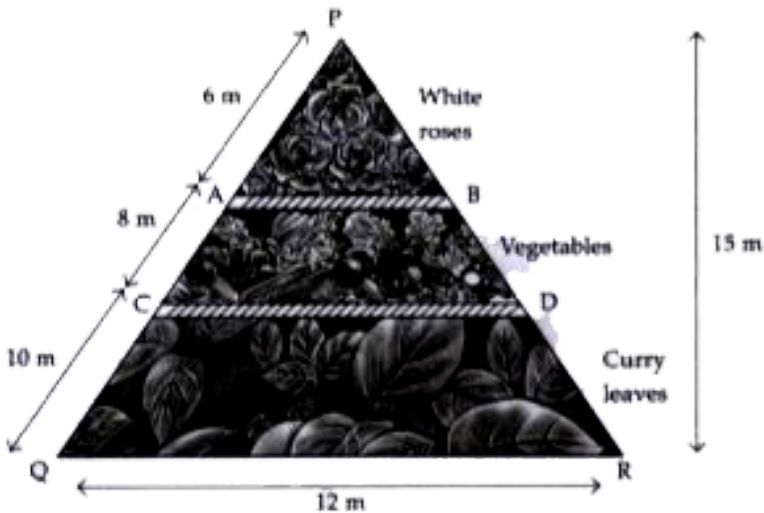
Based on the above information, answer the following questions:

The length of AB is:

   A. 3m

   B. 4m

C. 5m

D. 6m

Answer: A

▶ View Text Solution

11. In the backyard of house, Shikha has some empty space in the shape of a $\triangle PQR$. She decided to make it a garden. She divided the whole space into three parts by making boundaries AB and CD using bricks to grow flowers and vegetables where AB||CD||QR as shown in figure.

Based on the above information, answer the following questions:
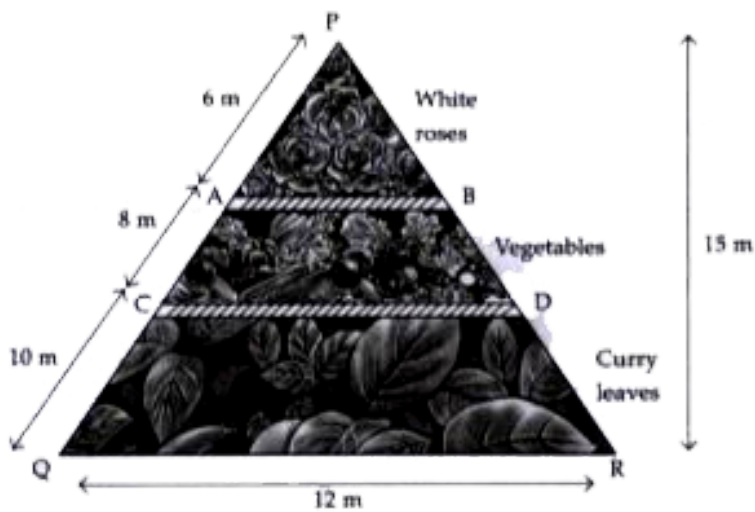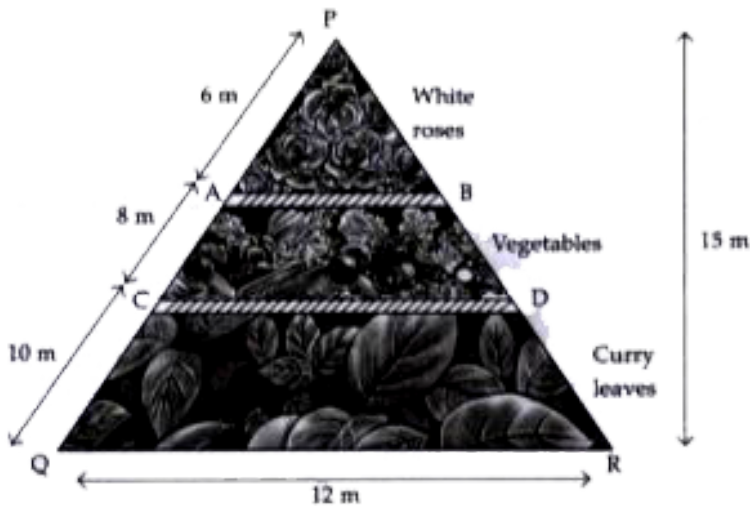
The length of CD is:

A. 4m

B. 5m

C. 6m

D. 7m

Answer: D

▶ View Text Solution

12. In the backyard of house, Shikha has some empty space in the shape of a $\triangle PQR$. She decided to make it a garden. She divided the whole space into three parts by making boundaries AB and CD using bricks to grow flowers and vegetables where AB||CD||QR as shown in figure.

Based on the above information, answer the following questions:

Area of whole empty land is:

A. $90m^2$
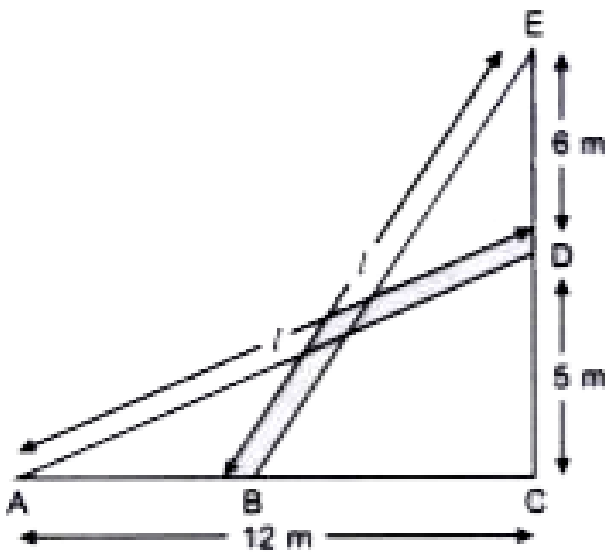
B. $60m^2$

C. $32m^2$

D. $72m^2$

Answer: A

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Passage Based Questions

1. The foot of a ladder is 12 m away from a wall and its top reaches a window 5 m above the ground. The ladder is shifted in such a way that its top touches the roof which is 6 m above the window.

Based on the given information, answer the following questions :

What is the length of the ladder?

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2. The foot of a ladder is 12 m away from a wall and its top reaches a window 5 m above the ground. The ladder is shifted in such a way that its top touches the roof which is 6 m above the window.
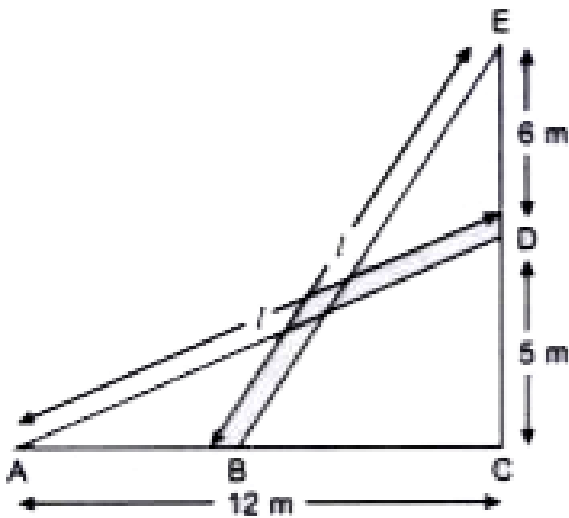
Based on the given information, answer the following questions :

How much the foot of ladder is shifted towards the wall, so that the top of ladder touches the roof?

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3. An aeroplane leaves an airport and flies due North at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due West at a speed of 1200 km per hour.

Based on the following information, answer the following

questions:

How far apart will be the planes after $1\frac{1}{2}$ hour?

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4. An aeroplane leaves an airport and flies due North at a speed of 1000 km per hour. At the same time, another aeroplane leaves the same airport and flies due West at a speed of 1200 km per hour.

Based on the following information, answer the following questions:

If the speed of first plane is 1600 km per hour, then find the distance between two planes after $1\frac{1}{2}$ hours?

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5. An aeroplane leaves an airport and flies due North at a speed of 1000 km per hour. At the same time, another aeroplane leaves the

same airport and flies due West at a speed of 1200 km per hour.

Based on the following information, answer the following questions:

If second plane flies in the South direction, then how far apart will be the planes after 1 hour?

6. Two spotlights, P and Q are mounted on a vertical pole AB, as shown below. Light beams from P and Q shine on two points on the ground, H and K respectively. Distance between two spotlights is 16 m, horizontal distance between first shine point and vertical pole is 16 m, distance of spotlight P and Q to its shine points on ground H and K is 35 m and 20 m respectively.
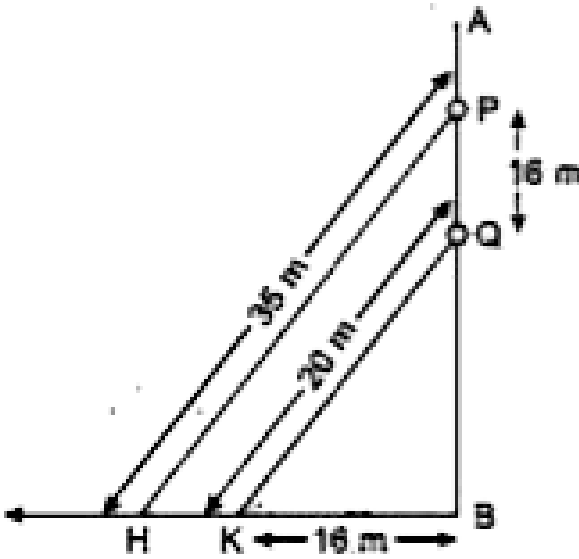
Based on the following information, answer the following questions :

The height above the ground at which the spotlight Q is mounted.

7. Two spotlights, P and Q are mounted on a vertical pole AB, as shown below. Light beams from P and Q shine on two points on the ground, H and K respectively. Distance between two spotlights is 16 m, horizontal distance between first shine point and vertical pole is

16 m, distance of spotlight P and Q to its shine points on ground H and K is 35 m and 20 m respectively.

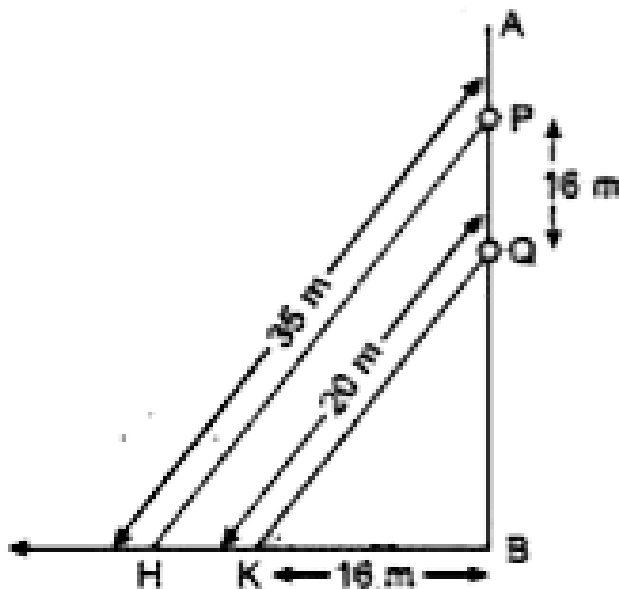Based on the following information, answer the following questions :

The distance between the projections of the light beams.

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Self Assessment

1. ABCD is a trapezium, in which AB || CD and AB = 2CD. Determine the ratio of the areas of $\triangle AOB$ and $\triangle COD$.

2. D and E are points on the sides AB and AC respectively of $\triangle ABC$ such that DE || BC and divides $\triangle ABC$ into two parts, equal in area. Find $\dfrac{BD}{AB}$.

3. A guy wire attached to a vertical pole of height 18 m is 24 m long hand has a stake attached to the other end. How far from the base of the pole should the stake be driven so that the wire will be taut?

4. An aeroplane leaves an airport and flies due north at speed of 1000 km/hr. At the same time, another plane leaves due west at a speed of 1200 km/hr. How far apart will the two planes be after 1 hour and 30 minute?

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