



MATHS

BOOKS - OBJECTIVE RD SHARMA MATHS

VOL I (HINGLISH)

SOLUTIONS OF TRIANGLES

Illustration

1. In a right triangle ABC, right angled at C, if $a = 7$ cm and $b = 7\sqrt{3}$ cm, then $\angle A =$

A. 30°

B. 60°

C. 45°

D. none of these

Answer: A



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2. In a $\triangle ABC$, if $B = 90^\circ$, then $\tan^2 \frac{A}{2} =$

A. $\frac{a - b}{a + b}$

B. $\frac{b - c}{b + c}$

C. $\frac{c - a}{c + a}$

D. $\frac{b + c}{b - c}$

Answer: B



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3. If $A = 30^\circ$, $c = 7\sqrt{3}$ and $C = 90^\circ$ in $\triangle ABC$, then $a =$

A. $7\sqrt{3}$

B. $7\sqrt{3}/2$

C. $7/2$

D. none of these

Answer: B



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4. If two sides and included angle of a triangle are respectively $3 + \sqrt{3}$, $3 - \sqrt{3}$ and 60° , then the third sides is

A. $2\sqrt{2}$

B. $4\sqrt{2}$

C. $3\sqrt{2}$

D. none of these

Answer: C



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5. If the angles of a triangle are 30° and 45° and the included side is $(\sqrt{3} + 1)$ cm then the area of the triangle is _____.

A. $\frac{\sqrt{3} - 1}{2} \text{ cm}^2$

B. $\frac{\sqrt{3} + 1}{2} cm^2$

C. $(\sqrt{3} - 1) cm^2$

D. none of these

Answer: B



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6. If $b = 3$, $c = 4$, and $B = \frac{\pi}{3}$, then find the number of triangles that can be constructed.

A. 0

B. 1

C. 2

D. Infinite

Answer: A



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7. In a $\triangle ABC$, a, c, A are given and b_1, b_2 are two values of third side b such that $b_2 = 2b_1$.

Then, the value of $\sin A$.

A. $\sqrt{\frac{9a^2 - c^2}{8a^2}}$

B. $\sqrt{\frac{9a^2 - c^2}{8c^2}}$

C. $\sqrt{\frac{9a^2 + c^2}{8a^2}}$

D. none of these

Answer: B



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Section I Solved Mcqs

1. In a $\triangle ABC$ if the length of the sides are $\sqrt{2}$, $\sqrt{6}$ and $\sqrt{8}$, then the measures of the angles are

A. 30° , 60° , 90°

B. 45° , 75° , 60°

C. 45° , 30° , 105°

D. none of these

Answer: A



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2. In a ΔABC , if $a = 100$, $c = 100\sqrt{2}$ and $A = 30^\circ$, then B equals to

A. 45° or 135°

B. 105° or 15°

C. 60° or 120°

D. none of these

Answer: B



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3. In a $\triangle ABC$, if $A = 45^\circ$ and $B = 75^\circ$, then

$$a + \sqrt{2}c =$$

A. b

B. $2b$

C. $3b$

D. none of these

Answer: B



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4. In a $\triangle ABC$, if $a = 40$, $c = 40\sqrt{3}$ and $B = 30^\circ$, then the triangle is

- A. isosceles
- B. equilateral
- C. right angled
- D. none of these

Answer: A



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5. If $a = \sqrt{3} + 1$, $B = 30^\circ$, $C = 45^\circ$, then $c =$

A. 3

B. 2

C. 4

D. none of these

Answer: B



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6. In a $\triangle ABC$, if $a = 4$, $b = 3$ and $\angle A = 60^\circ$, then c is a root of the equation

A. $c^2 - 3c - 7 = 0$

B. $c^2 + 3c + 7 = 0$

C. $c^2 - 3c + 7 = 0$

D. $c^2 + 3c - 7 = 0$

Answer: A



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7. In a triangle, the lengths of the two larger sides are 10 and 9, respectively. If the angles are in A.P., then the length of the third side can be

A. $5 \pm \sqrt{6}$

B. $3\sqrt{3}$

C. 5

D. none of these

Answer: A



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8. In a $\triangle ABC$, if

$b = \sqrt{3} + 1$, $c = \sqrt{3} - 1$ and $A = 60^\circ$, then

the value of $\tan\left(\frac{B - C}{2}\right)$ is

A. -1

B. $1/2$

C. 1

D. none of these

Answer: C



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9. Let the angles A , B and C of triangle ABC be in AP . and let $b:c$ be $\sqrt{3}:\sqrt{2}$. Find angle A .

A. 75°

B. 60°

C. 45°

D. 30°

Answer: A



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10. In a $\triangle ABC$, if $A = 120^\circ$, $b = 2$ and $C = 30^\circ$, then $a =$

A. $2\sqrt{3}$

B. 2

C. $\frac{\sqrt{3}}{2}$

D. $\frac{1}{2}$

Answer: A



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11. In a $\triangle ABC$, if $A = 30^\circ$, $C = 105^\circ$ and $b = 3\sqrt{2}$, then $a =$

A. $\sqrt{2}$

B. 3

C. $3\sqrt{2}$

D. 2

Answer: B



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12. If $a = \sqrt{3} + 1$, $B = 30^\circ$, $C = 45^\circ$, then

$c =$

A. 2

B. 3

C. 4

D. none of these

Answer: A



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13. In a $\triangle ABC$, if $a = 3$, $b = 2\sqrt{3}$ and $c = \sqrt{3}$,

then $A =$

A. 30°

B. 45°

C. 60°

D. 75°

Answer: C



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14. In a $\triangle ABC$, if $a = 5$, $B = 45^\circ$ and $c = 2\sqrt{2}$,
then $b =$

A. $\sqrt{3}$

B. 6

C. $2\sqrt{13}$

D. $\sqrt{13}$

Answer: D



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15. In $\triangle ABC$, If $\frac{b}{c^2 - a^2} + \frac{a}{c^2 - b^2} = 0$, then

$\angle C =$

A. $\frac{\pi}{2}$

B. $\frac{\pi}{4}$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{3}$

Answer: D



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16. In the ambiguous case, if a, b and A are given and c_1, c_2 are the two values of the third side, then $(c_1 - c_2)^2 + (c_1 + c_2)^2 \tan^2 A$ is equal to

A. 4

B. $4a^2$

C. $4b^2$

D. $4c^2$

Answer: B



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Exercise

1. If $b = 3$, $c = 4$, and $B = \frac{\pi}{3}$, then find the number of triangles that can be constructed.

A. Infinite

B. two

C. one

D. nil

Answer: D



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2. If the data given to construct a triangle ABC are $a = 5$, $b = 7$, $\sin A = \frac{3}{4}$, then it is possible to construct

- A. only one triangle
- B. two triangles
- C. infinitely many triangles
- D. no triangles

Answer: D



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3. We are given b , c and $\sin B$ such that B is acute and $b < c \sin B$. Then,

A. no triangle is possible

B. one triangle is possible

C. two triangles are possible

D. a right-angled triangle is possible

Answer: A



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4.

In

a

ABC , if $a = 2$, $\angle B = 60^\circ$ and $\angle C = 75^\circ$,

then $b = \sqrt{3}$ (b) $\sqrt{6}$ (c) $\sqrt{9}$ (d) $1 + \sqrt{2}$

A. $\sqrt{3}$

B. $\sqrt{6}$

C. $\sqrt{9}$

D. $1 + \sqrt{2}$

Answer: B



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5.

In

ΔABC , if $A = 30^\circ$, $b = 8$, $a = 6$, $B = \sin^{-1} x$

, then $x =$

A. $1/2$

B. $1/3$

C. $2/3$

D. 1

Answer: C



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6. If $a = 2$, $b = 3$, $c = 5$ in $\triangle ABC$, then $C =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2}$

D. none of these

Answer: D



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7. A triangle side are few 7cm , $4\sqrt{3}\text{cm}$ and $\sqrt{13}\text{cm}$ then the smallest angle is

A. 15°

B. 45°

C. 30°

D. none of these

Answer: C



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8. In a $\triangle ABC$, if $c = 2$, $A = 120^\circ$, $a = \sqrt{6}$, then

C=

A. 30°

B. 60°

C. 45°

D. none of these

Answer: C



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9. If $A = 30^\circ$, $a = 7$, and $b = 8$ in ABC , then find the number of triangles that can be constructed.

- A. one solution
- B. two solutions
- C. no solutions
- D. none of these

Answer: B



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10. If a ΔABC , $b = 2$, $C = 60^\circ$, $c = \sqrt{6}$, then a
=

A. $\sqrt{3} - 1$

B. $\sqrt{3}$

C. $\sqrt{3} + 1$

D. none of these

Answer: C



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11. If $c = 6$ in ΔABC , $a = 5$, $b = 4$ and $\cos(A - B) = \frac{31}{32}$, then

A. 6

B. 7

C. 9

D. none of these

Answer: A



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12. In a $\triangle ABC$, If

$A = 30^\circ$, $b = 2$, $c = \sqrt{3} + 1$, then $\frac{C - B}{2}$ is

A. 15°

B. 30°

C. 45°

D. none of these

Answer: B



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13. In a $\triangle ABC$ if $a = 2$, $b = \sqrt{6}$, $c = \sqrt{3} + 1$,

then $\cos A =$

A. 30°

B. 45°

C. 60°

D. none of these

Answer: B



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14. In a $\triangle ABC$, if $A = 45^\circ$, $b = \sqrt{6}$, $a=2$, then

B=

A. 30° or 150°

B. 60° or 120°

C. 45° or 135°

D. none of these

Answer: B



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15. In a triangle, the lengths of the two larger sides are 10 and 9, respectively. If the angles are in A.P., then the length of the third side can be $5 - \sqrt{6}$ (b) $3\sqrt{3}$ (c) 5 (d) $5 + \sqrt{6}$

A. $5 \pm \sqrt{6}$

B. 0.7

C. $\sqrt{5} + 6$

D. none of these

Answer: A



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16. The sides of a triangle are $3x + 4y$, $4x + 3y$ and $5x + 5y$ units, where $x, y > 0$. The \triangle is

- A. right angled
- B. equilateral
- C. obtuse angled
- D. none of these

Answer: C



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17. In a $\triangle ABC$, a, b, A are given and c_1, c_2 are two values of the third side c . The sum of the areas of two triangles with sides a, b, c_1 and a, b, c_2 is

A. $(1/2)b^2 \sin 2A$

B. $(1/2)a^2 \sin 2A$

C. $b^2 \sin 2A$

D. none of these

Answer: A



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18. In the ambiguous case, if a, b and A are given and c_1, c_2 are the two values of the third side, then $(c_1 - c_2)^2 + (c_1 + c_2)^2 \tan^2 A$ is equal to

A. $2\sqrt{a^2 - b^2}$

B. $\sqrt{a^2 - b^2 \sin^2 A}$

C. $2\sqrt{a^2 - b^2 \sin^2 A}$

D. $\sqrt{a^2 - b^2}$

Answer: C



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19. In the ambiguous case, if a, b and A are given and c_1, c_2 are the two values of the third side, then $(c_1 - c_2)^2 + (c_1 + c_2)^2 \tan^2 A$ is equal to

A. $4a^2 \cos^2 A$

B. $4a^2 \cos A$

C. $4a \cos^2 A$

D. none of these

Answer: A



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20. The smallest angle of the triangle whose sides are $6 + \sqrt{12}$, $\sqrt{48}$, $\sqrt{24}$ is

A. $\pi / 3$

B. $\pi / 4$

C. $\pi / 6$

D. none of these

Answer: C



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