



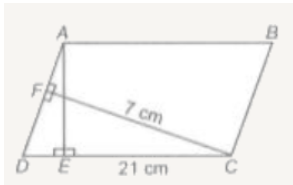
MATHS

BOOKS - HT Olympiad Previous Year Paper

AREAS OF PARALLELOGRAMS AND TRIANGLES

Mathematical Reasoning

1. In the given figure, ABCD is a parallelogram, $AE \perp DC$ and $EF \perp AD$. If $AD = 15$ cm, $CD=21$ cm and $CF = 7$ cm, then find AE .



A. 10 cm

B. 7 cm

C. 8 cm

D. 5 cm

Answer: D



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2. Find the area of a trapezium ABCD in which

$AB \parallel DC$, $AB = 77\text{cm}$, $BC = 25\text{cm}$,

$CD = 60\text{cm}$ and $DA = 26\text{cm}$.

A. 204 cm^2

B. 1644 cm^2

C. 1645 cm^2

D. 1600 cm^2

Answer: B



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3. The diagonals of a parallelogram divides it into two-

A. Triangles of equal area

B. Congruent triangles

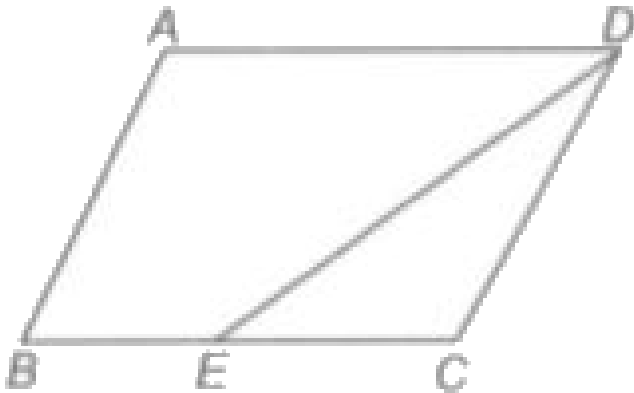
C. Equal parallelograms

D. Both (A) and (B)

Answer: D



4. In the given figure, if ABCD is a parallelogram and E is the mid-point of BC, then $ar(\triangle DEC) = k ar(ABCD)$. Find k.



A. 2

B. $\frac{1}{4}$

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

D. $\frac{2}{3}$

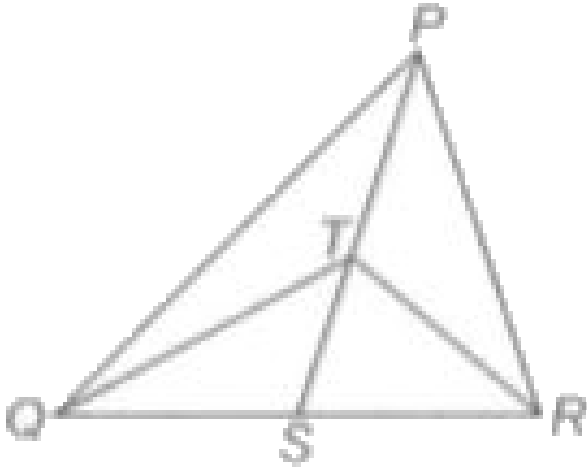
Answer: B



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5. In the given figure, PQR is a triangle and T is the mid-point of PS. Then area of $\Delta TQR = k$

area of $\triangle PQR$. Find K.



A. 2

B. $\frac{1}{4}$

C. 4

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

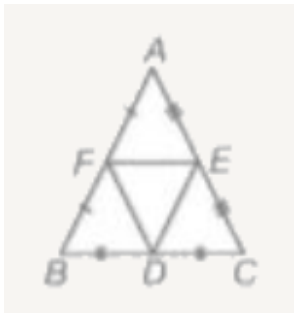
Answer: D



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6. In the given figure, if

$ar(\triangle ABC) = 28 \text{ cm}^2$ then $ar(AEDF) =$



A. 21 cm^2

B. 18 cm^2

C. 16 cm^2

D. 14 cm^2

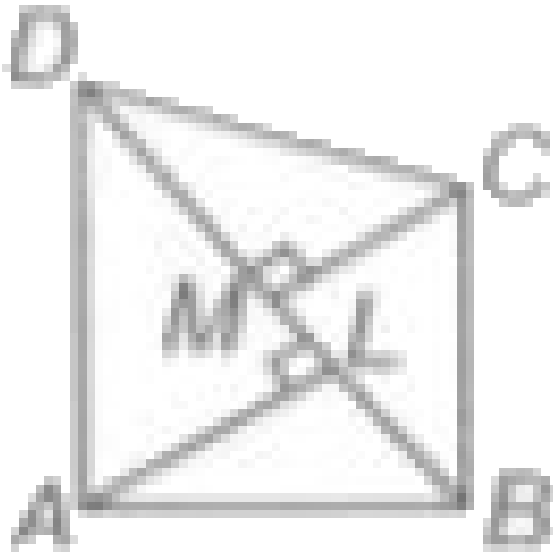
Answer: D



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7. In the given figure, ABCD is a quadrilateral with $BD = 30 \text{ cm}$. If $AL \perp BD$ and $CM \perp BD$ such that $AL = 15 \text{ cm}$ and $CM = 8 \text{ cm}$, then find

the area of quadrilateral ABCD.



A. 345 cm^2

B. 180 cm^2

C. 100 cm^2

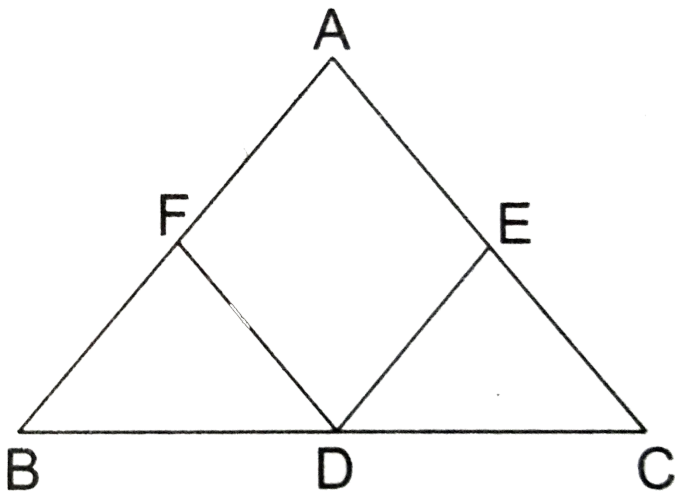
D. 340 cm^2

Answer: A



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8. The midpoints of the sides of a triangle along with any of the vertices as the fourth point makes a parallelogram of area equal to



A. $\frac{1}{2}$ area (ΔABC)

B. $\frac{1}{3}$ area (ΔABC)

C. $\frac{1}{4}$ area (ΔABC)

D. area (ΔABC)

Answer: A

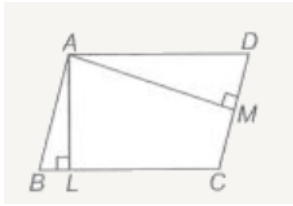


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9. In the given figure, ABCD is a parallelogram,

$AL \perp BC$, $AM \perp CD$, $AL = 4$ cm and

AM=5 cm. If BC=6.5 cm then find CD.



A. 5.2 cm

B. 8.7 cm

C. 6.5 cm

D. 3.3 cm

Answer: A



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10. ABCD is a trapezium with parallel sides $AB = a$ cm and $DC = b$ cm, E and F are the mid-points of the non-parallel sides. Find the ratio of $\text{ar}(\text{ABFE})$ and $\text{ar}(\text{EFCD})$.

A. $(3b + a) : (3a + b)$

B. $(3a + b) : (3b + a)$

C. $(2a + 3b) : (3a + b)$

D. $(3a + 2b) : (2a + 3b)$

Answer: B



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11. ABCD is a rectangle with O as any point in its interior. If $ar(\Delta AOD) = 3 \text{ cm}^2$ and $ar(\Delta BOC) = 6 \text{ cm}^2$, then area of rectangle ABCD is

A. 9 cm^2

B. 12 cm^2

C. 15 cm^2

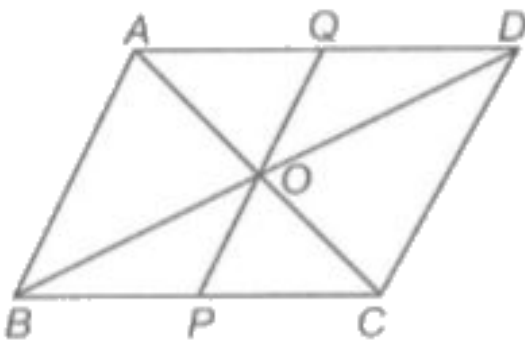
D. 18 cm^2

Answer: D



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12. The diagonals AC and BD of a parallelogram ABCD intersect each other at O. PQ is a line through O which meets BC at P and AD at Q. If $\text{ar}(\text{quad. ABPQ}) = k \text{ ar}(\text{Parallelogram ABCD})$, then $k =$



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

B. 4

C. 3

D. $\frac{1}{4}$

Answer: A



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13. Two parallelograms are on equal bases and between the same parallels.

The ratio of their areas is

A. 1:2

B. 1:1

C. 2:1

D. 3:1

Answer: B



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14. ABCD is a parallelogram. P is any point on

CD. If $ar(\triangle DPA) = 15 \text{ cm}^2$ and

$ar(\triangle APC) = 20 \text{ cm}^2$, then $ar(\triangle APB) =$

A. 15 cm^2

B. 20 cm^2

C. 35 cm^2

D. 30 cm^2

Answer: C



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15. If AD is median of $\triangle ABC$ and P is a point
on AC such that

$$ar(\Delta ADP) : ar(\Delta ABD) = 4 : 5$$

then

$ar(\Delta PDC) : ar(\Delta ABC)$ is

A. 1 : 10

B. 10 : 1

C. 1 : 3

D. 3 : 1

Answer: A



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16. The area of a trapezium whose parallel sides are 9 cm & 16 cm and the distance between these sides is 8 cm, is

A. 60 cm^2

B. 72 cm^2

C. 56 cm^2

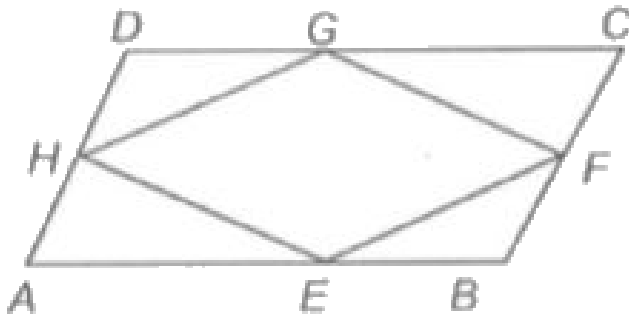
D. 100 cm^2

Answer: D



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17. If E, F, G and H are the mid-points of sides of a parallelogram ABCD, then $\text{ar}(\text{EFGH}) =$



A. $\frac{1}{3} \text{ar}(\text{ABCD})$

B. $\text{ar}(\text{ABCD})$

C. $\frac{1}{2} \text{ar}(\text{ABCD})$

D. $\frac{1}{4} \text{ar}(\text{ABCD})$

Answer: C



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Achievers Section Hots

1. Read the statements carefully and write 'T' for true and 'F' for false.

(a) Two parallelograms on the same base and between the same parallel lines are of unequal areas.

(b) The ratio of area of rectangle and a

triangle having the same base and between the same parallel is 2 : 1

(c) The area of a parallelogram is the product of its base and the corresponding altitude.

A. (a) (b) (c)
 F T F

B. (a) (b) (c)
 T T T

C. (a) (b) (c)
 T F T

D. (a) (b) (c)
 F T T

Answer: D



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2. ABCD is a parallelogram, G is the point on AB such that $AG = 2 GB$, E is point on DC such that $CE = 2DE$ and F is the point on BC such that $BF = 2FC$. Then, match the following:

Column-I

Column-II

P. $\text{ar} (\text{ADEG})$ (*i*) $\frac{1}{6} \text{ar} (\text{ABCD})$

Q. $\text{ar} (\triangle EGB)$ (*ii*) $\text{ar} (\text{GBCE})$

R. $\text{ar} (\triangle EFC)$ (*iii*) $\frac{1}{2} \text{ar} (\triangle EBF)$

A. P Q R
 (*i*) (*ii*) (*iii*)

B. P Q R
 (*ii*) (*i*) (*iii*)

C. P Q R
 (*iii*) (*i*) (*ii*)

D. P Q R
(*ii*) (*iii*) (*i*)

Answer: B



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