INTEGRATED+

Class: VIII, MATHEMATICS

09. AREAS OF PLANE FIGURES

TEACHING TASK (JEE MAINS)

01. **Triangle**

Area $= \frac{1}{2} \times b \times h = \frac{1}{2} \times 10 \times 6 = 30$ Ans: B

02 **Square**

Area $= a^2 = 4^2 = 16$ Ans: B

03 **Rectangle**

Area $= l \times b = 15 \times 7 = 105$ Ans: A

04 Rectangle

Perimeter $= 2(l+b) = 2(10+5) = 30$ Ans. A

05 triangle

Area $= \frac{1}{2} \times 8 \times 5 = 20$ Ans. A

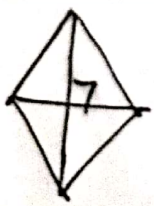
06 Perimeter $= 2(l+b) = 40$

$2(12+b) = 40 \Rightarrow b = 8$ Ans: A

07 Trapezium

Area $= \frac{1}{2} h(a+b) = \frac{1}{2} \times 6 (9+15) = 72$ Ans. A

08



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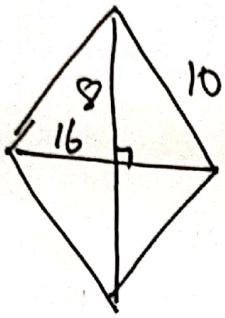
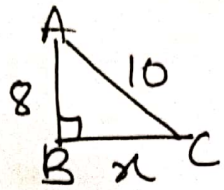




$x^2 + 8^2 = 10^2$ (2)

$\Rightarrow x = 6$

$\therefore$ Diagonal $= 2 \times 6 = 12$

Ans: C

09. Parallelogram

~~Area $= b \times h = 21 \times \frac{2}{3} = 2$~~

base $= 21$ cm

height $= \frac{2}{3} \times 21 = 14$

$\therefore$ Area $= b \times h = 21 \times 14 = 294\ cm^2$ Ans: C

10. Perimeter of Rhombus $= 48$ cm

$\therefore \quad 4a = 48 \Rightarrow a = 12$ Ans: C

11. Rectangle $l = 18, \quad b = 6$

Perimeter $= 2(l + b) = 2(18 + 6) = 48$ mt

Area $= l \times b = 18 \times 6 = 108\ mt^2$ Ans: A, B

12 Trapezium

$\text{Area} = \frac{1}{2} h (a + b)$

$= \frac{1}{2} \times 6 \times (14 + 10) = 72\ cm^2$

Sides doubled

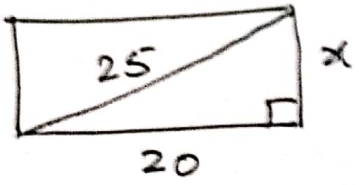
New, area $= \frac{1}{2} \times 6 \times (28 + 20) = 144\ cm^2$

height doubled

New, area $= \frac{1}{2} \times 12 \times (14 + 10) = 144\ cm^2$

Ans: A, C, D

13 Statement I:



$x^2 + 20^2 = 25^2 \Rightarrow x = 15$ cm (True)

Statement II: ~~Concept~~ perimeter $= 2(l+b)$

$= 2(20+15)$

$= 70$ cm (True)

Ans. A

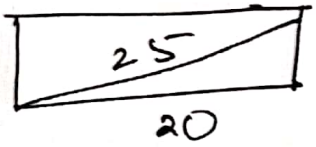
14 Statement I: Trapezium

$\text{Area} = \frac{1}{2}h(a+b) = \frac{1}{2} \times 6 \times (10+18) = 84\ cm^2$ (False)

Statement II: Conceptual (False)

Ans. B

15 Assertion:



$\therefore x^2 + 20^2 = 25^2 \Rightarrow x = 15$ (True)

Reason: Conceptual (True)

Ans. A

16. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans. A

17. Perimeter of square $= 4a = 48$

$\Rightarrow a = 12$

Ans. C

18 Area of square $= a^2 = 12^2 = 144$.

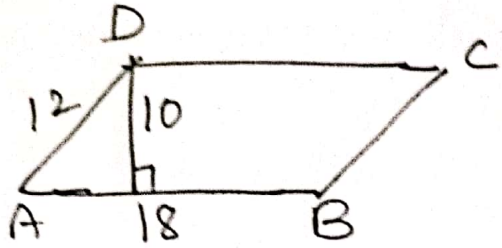
Perimeter of rectangle $= 2(l+b) = 48$

$\Rightarrow l + b = 24$

$\Rightarrow 16 + b = 24 \Rightarrow b = 8$

Area $= l \times b = 16 \times 8 = 128$ $\therefore$ square more area

Ans: A

19. 

$b = 18,\ h = 10$ (4)

Area $= b \times h$

$= 18 \times 10 = 180\ cm^2$

Ans: A

20 Perimeter $= 2(18 + 12) = 60$ cm Ans. B

21. Area of square $= 18^2 = 324$.

Area of rectangle $= l \times b = 324$

$l \times 9 = 324$

$\Rightarrow l = 36$

$\therefore$ Perimeter of rectangle $= 2(l + b)$

$= 2(36 + 9)$

$= 90$ cm Ans: 90

22 Perimeter $= 2(l + b) = 50$

$l + b = 25$

$\Rightarrow 12 + b = 25 \quad \Rightarrow b = 13$

Ans. 13

23 a) Area $= l \times b = 96$

$12 \times b = 96 \Rightarrow b = 8$ (x)

b) Perimeter $= 100 \Rightarrow 4a = 100 \Rightarrow a = 25$ (y)

b) Area $= \frac{1}{2} \times b \times h = 30$ | $h = 5$ (q)

$\Rightarrow b \times h = 60$

$\Rightarrow 12 \times h = 60$

d) Perimeter $= 2(l + b)$

$= 2(15 + 10) = 50$ cm (p)

Ans: x, 15, 2, 5

24 a) Area $= \frac{1}{2} \cdot d_1 \cdot d_2 = \frac{1}{2} \times 10 \times 24 = 120$ (r) (5)

b) Perimeter $= 2(l + b)$

$= 2(9 + 13) = 44$ (q)

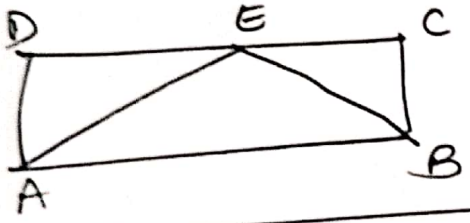
c) Area $= b \times h = 70$

$\Rightarrow 7 \times h = 70 \quad \Rightarrow h = 10$ (s)

d) Area $= \frac{1}{2} \cdot d_1 \cdot d_2 = \frac{1}{2} \times 14 \times 8 = 56$ (p)

Ans: r, q, s, p

LEARNERS TASK (CUL'S)

01. 

Rectangle has greater area

Ans. B

02 Conceptual — Ans: C

03 Conceptual — Ans: C

04 Conceptual — Ans: D

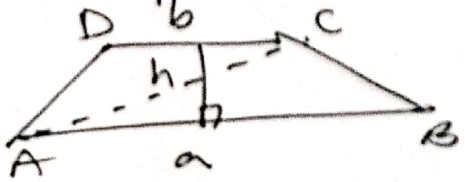
05 Conceptual — Ans. B

06. Conceptual — Ans: C

07. Conceptual — Ans: C

08 Conceptual — Ans: C

09. Conceptual



Area of trapezium = Ar. of $\triangle ABC$ + Ar $\triangle ACD$

$= \frac{1}{2} \times a \times h + \frac{1}{2} \times b \times h$

$= \frac{1}{2} \times h (a + b)$

Ans: A

10. conceptual ⑥ Ans: C

JEE MAINS LEVEL

01. Perimeter $= 4a = 4 \times 6 = 24$ cm — Ans: C

02 Area $= l \times b = 10 \times 4 = 40$ cm — Ans: A

03 Perimeter $= 5 + 7 + 8 = 20$ cm — Ans: A

04 Perimeter $= 4 \times 9 = 36$ — Ans: B

05 Perimeter $= 2(l + b)$
$= 2(8 + 3) = 22$ — Ans: A

06 Area $= b \times h = 18 \times 7 = 126$ — Ans B

07. Area $= \frac{1}{2} \times d_1 \times d_2 = 120$
$\Rightarrow d_1 \times d_2 = 240$
$\Rightarrow 12 \times d_2 = 240$
$d_2 = 20$ — Ans: D

08 Parallelogram
$b = 15$
$h = 8$
Area $= 15 \times 8$

Rectangle
$l = 15$
$b = ?$

Area $= 15 \times 8$
$l \times b = 15 \times 8$
$15 \times b = 15 \times 8$
$b = 8$ — Ans: C

09 Area $= \frac{1}{2} \times h \times (a + b) = 210$
$\Rightarrow \frac{1}{2} \times h \times (20 + 10) = 210 \Rightarrow h = 14$ — Ans: B

10. Area $= \frac{1}{2} \times h \times (a + b) = 126$
$\frac{1}{2} \times 7 \times (12 + b) = 126$
$\Rightarrow b = 24$ — Ans: B

11 Perimeter $= 4+7+9 = 20$

$s = \frac{a+b+c}{2} = \frac{20}{2} = 10.$

Area $= \Delta = \sqrt{s(s-a)(s-b)(s-c)}$

$= \sqrt{10 \times 6 \times 3 \times 1} = \sqrt{180}$

$= \sqrt{36 \times 5} = 6\sqrt{5}$

Ans: A, C, D

12 Area of parallelogram $= b \times h$

$= 15 \times 8 = 120$

perimeter $= 2(15+8) = 46$

base doubled

Area $= 30 \times 8 = 240$

Ans: A, B, D

13 Statement I: Area $= \frac{1}{2} \times b \times h$

$\Rightarrow 45 = \frac{1}{2} \times 9 \times 10$ ✓ (True)

Statement II: Conceptual (True)

Ans. A

14. Statement I:

Area $= b \times h = 120$

$15 \times h = 120$

$\Rightarrow h = 8$ (True)

Statement II: Conceptual (False)

Ans. C

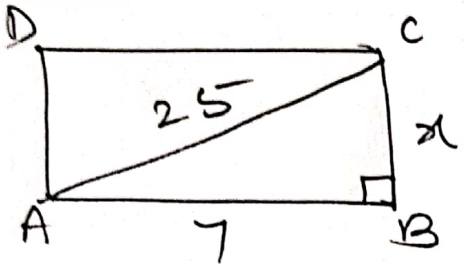
15 Assertion: Area $= a^2 = 81 \Rightarrow a = 9.$

$\therefore$ perimeter $= 4a = 4 \times 9 = 36$ cm ✓

Reason: Area $= a^2 \Rightarrow a = \sqrt{\text{area}}$ ✓

Ans. A

16 Assertion: Conceptual (TOU) (8)
Reason: Conceptual (TOU) Ans A

17. 

$x^2 + 7^2 = (25)^2$

$x = 24$

Ans. D

18 Area $= l \times b = 7 \times 24$

$= 168$

Ans: A

19. Area $= \frac{1}{2} \times h \times (a+b)$

$= \frac{1}{2} \times 9 \times (14+22) = 162$

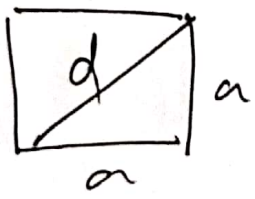
Ans: B

20 $a = 14 \rightarrow$ 50% increase $\rightarrow b = 28$

$b = 22 \rightarrow$ 50% increase $\rightarrow b = 44$

New Area $= \frac{1}{2} \times 9 \times (28+44) = 324$

Ans. C

21. 

$a^2 + a^2 = d^2$

$\Rightarrow 2a^2 = (10\sqrt{2})^2 = 200$

$a = 10$.

$\therefore$ perimeter $= 4a = 4 \times 10 = 40$

Ans. 40

22 Area $= \frac{1}{2} \times h \times (a+b)$

$= \frac{1}{2} \times 6 \times (10+18)$

$= 84 \text{ cm}^2$

Ans. 84

23 a) Perimeter $= 2(l+b) = 50$ | $l = 15$ (r) (3)

$\Rightarrow l + b = 25$

$\Rightarrow l + 10 = 25$

b) Area $= a^2 = 36 \Rightarrow a = 6$ (p)

c) perimeter $= 3a = 54 \Rightarrow a = 18$ (q)

d) 

$\Rightarrow x^2 + 8^2 = 10^2 \Rightarrow x = 6$ (p)

Ans: r, p, q, p

24 a) Area $= b \times h = 10 \times 6 = 60$ (r)

b) Area $= \frac{1}{2} \times h \times (a+b) = \frac{1}{2} \times 5 \times (8+12)$

$= 50$ (q)

c) Perimeter $= 4 \times a = 4 \times 16 = 64$ (p)

d) $\frac{1}{2} \times d_1 \times d_2 = 96$

$\Rightarrow \frac{1}{2} \times 12 \times d_2 = 96$

$\Rightarrow d_2 = 16$ (s)

Ans: r, q, p, s

$\Rightarrow$ THE END $\in$