

(A) ANSWERS :-

1. (c) $(10-6) \text{ sec} = 100 \text{ m/s}$
 $4 \text{ " } = 100 \text{ "}$
 $1 \text{ " } = \frac{25 \text{ "}}{150 \text{ "}}$

2. (b) Semi-perimeter of base (s) = $\frac{13+20+21}{2} = 27 \text{ cm}$

Area of the base = $\sqrt{27(27-13)(27-20)(27-21)}$
 $= 126 \text{ cm}^2$

$\therefore$ The Volume of the prism = Area of the base $\times$ altitude
 $= (126 \times 9) \text{ cm}^3$
 $= 1134 \text{ cm}^3$

3. (d) Let the work be finished in x days.

$\therefore$ According to the question:-

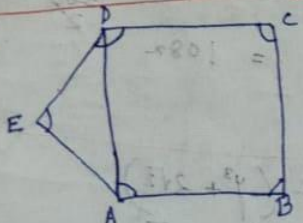
$\frac{7}{35} + \frac{x}{45} = 1$

$\Rightarrow \frac{x}{45} = (1 - \frac{1}{5}) = \frac{4}{5}$

$x = (\frac{4}{5} \times 45)$

$x = 36 \text{ days}$

1. (b)



Here, Each interior angle of a regular polygon is: $\frac{180(n-2)}{n}$

$= \left\{ \frac{180 \times (5-2)}{5} \right\} = 108^\circ$

$\therefore$ In $\triangle ADE$; $AE = ED$

$\therefore \angle EDA = \angle EAD$

Now, $\angle AED = 108^\circ$; then $\angle EDA = \angle EAD = \frac{180^\circ - 108^\circ}{2} = 36^\circ$

$\therefore$ Required Ratio: $\angle ADE : \angle ADC = 36^\circ : (108^\circ - 36^\circ)$
 $= 36 : 72 = 1 : 2$

[A] :- ANSWERS :- (7)

$$\begin{aligned} 5(a) \quad & \pi \cdot \cot \frac{\pi}{20} \cdot \cot \frac{3\pi}{20} \cdot \cot \frac{5\pi}{20} \cdot \cot \frac{7\pi}{20} \cdot \cot \frac{9\pi}{20} \quad \left[\pi = 180^\circ \right] \\ & = \pi \cot 9^\circ \cdot \cot 27^\circ \cdot \cot 45^\circ \cdot \cot 63^\circ \cdot \cot 81^\circ \\ & = \pi (\cot 9^\circ \cdot \cot 81^\circ) \cdot (\cot 27^\circ \cdot \cot 63^\circ) \cdot \cot 45^\circ \quad \left[\text{Since, } \tan(90^\circ - \theta) = \cot \theta \right] \\ & = \pi (\tan 9^\circ \cdot \cot 9^\circ) \cdot (\tan 27^\circ \cdot \cot 27^\circ) \cdot \cot 45^\circ \\ & = \pi \cdot 1 \cdot 1 \cdot 1 = \boxed{\pi} \end{aligned}$$

$$\begin{aligned} 6(b) \quad & a+b - \frac{1}{a+ab+b^2} \\ & = (a+b) - \frac{(a-b)}{(a-b)(a+ab+b^2)} \\ & = (a+b) - \frac{(a-b)}{(a^3-b^3)} \quad \left[\text{Since, } (a^3-b^3) = (a-b)(a+ab+b^2) \right] \\ & = (a+b) - \frac{(a-b)}{28-27} \\ & = (a+b - a + b) = 2b = (2 \times \sqrt[3]{27}) = \boxed{6} \end{aligned}$$

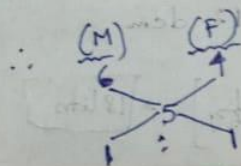
$$\begin{aligned} 7(b) \quad & \text{Here, } CP = MRP \\ \text{Let } CP = MRP & = ₹ 100x \\ SP & = 80x \\ \therefore \text{Profit}(\%) & = \boxed{8\%} \end{aligned}$$

$$\begin{aligned} 300 &= 80x \\ 1 &= \frac{80x}{300} \\ 405 &= \frac{80x \times 405}{300} \\ &= 108x \end{aligned}$$

$$\begin{aligned} 8(a) \quad & x = \sqrt{3} + \sqrt{2} \quad \therefore (x^3 - 20\sqrt{2}) - (y^3 + 2\sqrt{2}) \\ & y = \sqrt{3} - \sqrt{2} \\ & x - y = 2\sqrt{2} \\ & \therefore (x^3 - 20\sqrt{2}) - (y^3 + 2\sqrt{2}) \\ & = x^3 - 20\sqrt{2} - y^3 - 2\sqrt{2} \\ & = x^3 - y^3 - 22\sqrt{2} \\ & = (x-y)^3 + 3xy(x-y) - 22\sqrt{2} \\ & = (2\sqrt{2})^3 + 3 \cdot 2 \cdot \sqrt{2} - 22\sqrt{2} \\ & = (16\sqrt{2} + 6\sqrt{2} - 22\sqrt{2}) \\ & = \boxed{0} \end{aligned}$$

(A) = ANSWERS :-

9. (a) The population increased by $= \left[\frac{36,750 - 35,000}{35,000} \times 100 \right] = 5\%$



Female $= \left(35,000 \times \frac{1}{2} \right) = 17,500$

10. (b) $x^2 + y^2 + z^2 = xy + yz + zx$
 $\Rightarrow x^2 + y^2 + z^2 - xy - yz - zx = 0$
 $\Rightarrow \frac{1}{2} [(x-y)^2 + (y-z)^2 + (z-x)^2] = 0$
 $\therefore x = y = z = 1$ (say)

11. (c) $\frac{3x^2 + 7y^2 + 5z^2}{5x^2 + 7y^2 + 3z^2} = \frac{3+7+5}{5+7+3} = 1$

11. (c) Radius of Wheel $(r) = 35$ cm
 Circumference of the Wheel $= 2\pi r = \left(2 \times \frac{22}{7} \times 35 \right) = 220$ cm
 Speed of the Car $= (220 \times 400 \times 60)$ cm/hr
 $\therefore (220 \times 400 \times 60) / 10^5$ [$\because 1 \text{ km} = 10^5 \text{ cm}$]
 $= 52.8 \text{ km/hr}$

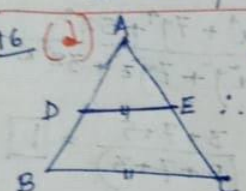
12. (c) Let the internal radius of the hollow sphere $= x$ cm.
 $\therefore \frac{4}{3}\pi (9^3 - x^3) = \frac{4}{3}\pi (1^3 + 6^3)$
 $x^3 = (219 + 729) = 948 \Rightarrow x = 8$
 $\therefore$ Thickness $= (9 - 8) \text{ cm} = 1 \text{ cm}$

13. (b)
 Let A and B are the respective centres of the circles.
 Now, PQ is direct common tangent.
 Here, $AB = (25 + 9) = 34$ cm; $GB = PC = 9$ cm;
 $\therefore AC = (25 - 9) = 16$ cm
 In $\triangle ABC$; $BC = \sqrt{(34)^2 - (16)^2} = 30$
 $\therefore BC = PQ = 30$ cm

(A) ANSWERS :- < 9 >

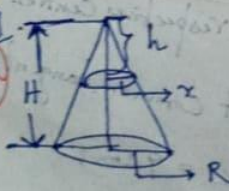
14 (a) 2 times = 5 yrs
 8 times $\rightarrow (2)^3 \rightarrow \therefore (5 \times 3) = \boxed{15 \text{ yrs}}$

15 (c) Side of Cubical tank = 1.2m = 12 dm
 Volume of the tank = $(12)^3 \text{ dm}^3$
 $\therefore$ Volume of buckets = $\left[(12)^3 \times \frac{2}{3} \times \frac{1}{64} \right] = \boxed{18 \text{ litres}}$

16 (d)  $\triangle ADE \sim \triangle ABC$ [Similar]
 $\therefore \frac{AD}{AB} = \frac{\text{Area } \triangle ADE}{\text{Area } \triangle ABC} = \frac{1}{2}$
 $\Rightarrow \frac{AD}{AB} = \frac{1}{\sqrt{2}}$
 $\Rightarrow \frac{AB - DB}{AB} = \frac{1}{\sqrt{2}} \Rightarrow 1 - \frac{DB}{AB} = \frac{1}{\sqrt{2}} \Rightarrow \frac{DB}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}}$

17 (c) LCM of 12, 16, 18, 21 is 1008.
 $\therefore (2 \times 1008) = 2016 = (2000 + 16)$
 $\therefore x = 16$
 $\therefore$ Sum of the digits of $x = (1+6) = \boxed{7}$

18 (c) Area = Base $\times$ Altitude
 Base = $\frac{\text{Area}}{\text{Altitude}}$
 $\therefore$ Ratio of Bases: $\frac{3}{4} : \frac{2}{5} = \boxed{15:8}$

19 (a)  $\frac{H^3}{h^3} = \frac{2}{1} \Rightarrow \frac{H}{h} = \sqrt[3]{2}$
 $h : (H-h) = \boxed{1 : (\sqrt[3]{2}-1)}$

(A) :- ANSWERS :- (10)

20. (b) Diameter of the sphere : (D) = $(2 \times \sqrt{3})$
 $= 12\sqrt{3} \text{ cm}$



(Front pic)

$\therefore$ Diagonal of the cube = $12\sqrt{3} \text{ cm}$

Side of the cube = $\frac{12\sqrt{3}}{\sqrt{3}} = 12 \text{ cm}$

$\therefore$ Surface area of the cube = $\{6 \times (12)^2\} \text{ cm}^2$
 $= \boxed{864 \text{ cm}^2}$

21. (a) Interior angle + Exterior angle = 180°

Interior angle - Exterior angle = 150°

$\therefore$ Exterior angle = $\left(\frac{180^\circ - 150^\circ}{2}\right) = 15^\circ$

$\therefore n(\text{Side}) = \frac{360^\circ}{\text{Exterior angle}} = \left(\frac{360^\circ}{15}\right) = \boxed{24}$

22. (c) Original CP = ₹ 100x

SP = ₹ 133x

Present CP = ₹ 112x

Present SP = ₹ $(133x + 13.3x) = ₹ 146.3x$

Now, Profit (%) = $\left[\frac{146.3x - 112x}{112x} \times 100\right] \%$

= $\frac{34.3}{112} \times 100$

= $\boxed{30 \frac{5}{8} \%}$

(A) ANSWERS :- <11>

23. (b) Let CP = ₹ 100x ; MRP = 140x

$$\therefore SP = \left(140x \times \frac{80}{100} \right) = ₹ 112x$$

∴ According to the question: $12x = 48$

$$\Rightarrow x = 4$$

$$\Rightarrow 100x = \boxed{₹ 400}$$

$$24. (c) \frac{x^3 - y^3}{x^2 + xy + y^2} = \frac{5}{1} \Rightarrow \frac{(x-y)(x^2 + xy + y^2)}{(x^2 + xy + y^2)} = \frac{5}{1}$$

$$\Rightarrow (x-y) = 5 \rightarrow (i)$$

$$\text{Again, } \frac{x^2 - y^2}{x-y} = \frac{7}{1} \Rightarrow \frac{(x+y)(x-y)}{(x-y)} = 7$$

$$\Rightarrow (x+y) = 7 \rightarrow (ii)$$

$$\therefore x = \left(\frac{7+5}{2} \right) = 6 ; y = \frac{7-5}{2} = 1$$

$$\text{Now, } 2x : 3y = (2 \times 6) : (3 \times 1) = \boxed{4:1}$$

25. LCM of 3, 5 and 1 is 60.

Let the no. of Oranges in each case is 60.

Oranges	CP ₁ (₹)	Oranges	CP ₂ (₹)	Total (₹) CP	Total SP
$\frac{1}{20} \times 60 = 3$	$\frac{1}{20} \times 20 = 1$	$\frac{1}{5} \times 60 = 12$	$\frac{1}{12} \times 12 = 1$	$(20+12) = ₹ 32$	$\frac{120}{4} = ₹ 30$

$$\therefore \text{Loss}(\%) = \left[\frac{32-30}{32} \times 100 \right] \% = \boxed{6.25\%}$$