

(1)

SECTION A (1m)

1. $\frac{\sqrt{3}a^2}{4} = 64\sqrt{3}$
 $a^2 = 64 \times 4$
 $a = 8 \times 2 = 16m (1m) - (B)$

2. $\frac{1}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = \sqrt{2}-1$
 $= 1.414 - 1 = 0.414 (1m) - (A)$

3. $S = \frac{22}{2} = 11$
 Area = $\sqrt{11(11-10)(11-5)(11-7)}$
 $= \sqrt{11 \times 1 \times 6 \times 4}$
 $= 2\sqrt{66} \text{ cm}^2 \rightarrow 1m (D)$

4. $17\sqrt{2} + 5\sqrt{2} - 10\sqrt{2}$
 $= 22\sqrt{2} - 10\sqrt{2} - (A)$

5. $13 + 14 + x = 2 \times 18$
 $27 + x = 36$
 $x = 9 \text{ cm} (B)$

6. $(4\sqrt{3} - \sqrt{5})^2$
 $= (4\sqrt{3})^2 - 2 \times 4\sqrt{3} \times \sqrt{5} + (\sqrt{5})^2$
 $= 48 - 8\sqrt{15} + 5$
 $= 53 - 8\sqrt{15} \rightarrow (C)$

7. ASSERTION REASONING.
 Ans: A & R are True (A)

SEC: B (2m)

8) $\frac{5}{11} = 0.\overline{45} \left(\frac{1}{2}\right)$
 $\frac{4}{19} = 0.21 \left(\frac{1}{2}\right)$
 a) $0.220220022000 \left(\frac{1}{2}\right) (C)$
 b) $0.231231123111 \dots \left(\frac{1}{2}\right)$

9) $\frac{30}{5\sqrt{3}-3\sqrt{5}} \times \frac{5\sqrt{3}+3\sqrt{5}}{5\sqrt{3}+3\sqrt{5}} (1m)$
 $= \frac{30(5\sqrt{3}+3\sqrt{5})}{75-45=30} \left(\frac{1}{2}\right)$
 $= 5\sqrt{3}+3\sqrt{5} \left(\frac{1}{2}\right)$

OR

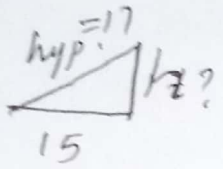
$\sqrt{32} = \sqrt{16 \times 2} = 4\sqrt{2}$
 $\sqrt{48} = \sqrt{16 \times 3} = 4\sqrt{3}$
 $\sqrt{8} = 2\sqrt{2}$
 $\sqrt{12} = 2\sqrt{3}$

$\frac{4\sqrt{2}-4\sqrt{3}}{2\sqrt{2}-2\sqrt{3}} + \frac{4\sqrt{2}+4\sqrt{3}}{2\sqrt{2}+2\sqrt{3}}$
 $= \frac{4(\sqrt{2}-\sqrt{3})}{2(\sqrt{2}-\sqrt{3})} + \frac{4(\sqrt{2}+\sqrt{3})}{2(\sqrt{2}+\sqrt{3})}$
 $= 2 + 2 = 4$

5/6/23
 28/5/23

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10.



$$\text{hyp}^2 - \text{Bas}^2 = h^2$$

$$17^2 - 15^2 = h^2$$

$$289 - 225 = h^2$$

$$h = \sqrt{64} = \underline{\underline{8}} \text{ (1m)}$$

$$\text{Area} = \frac{1}{2}bh$$

$$= \frac{1}{2} \times 15 \times 8$$

$$= 60 \text{ m}^2 \text{ (1m)}$$

SEC: \leq (3m)

11

$\sqrt{8.5}$ construction.

12.

$$25x + 17x + 12x = 540 \text{ (1m)}$$

$$54x = 540$$

$$x = \frac{540}{54} = 10$$

$$a = 25 \times 10 = 250$$

$$b = 17 \times 10 = 170$$

$$c = 12 \times 10 = 120$$

$$s = \frac{540}{2} = 270$$

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

$$= \sqrt{270(270-250)(270-170)(270-120)} \text{ (1m)}$$

$$= \sqrt{270 \times 20 \times 100 \times 150}$$

$$= 10 \times \sqrt{9 \times 3 \times 10 \times 2 \times 10 \times 3 \times 5 \times 10}$$

$$= 10 \times 3 \times 3 \times 10 \times 10$$

$$= \underline{\underline{9000 \text{ m}^2}} \text{ (1/2)}$$

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13

$$\frac{7 + 2\sqrt{5}}{7 - 2\sqrt{5}} \times \frac{7 + 2\sqrt{5}}{7 + 2\sqrt{5}} = \frac{(7 + 2\sqrt{5})^2}{7^2 - (2\sqrt{5})^2} \quad \{ \text{lm} \}$$

$$= \frac{7^2 + 2 \times 7 \times 2\sqrt{5} + (2\sqrt{5})^2}{49 - 20} \quad (\frac{1}{2})$$

$$= \frac{49 + 28\sqrt{5} + 20}{29} \quad (\frac{1}{2})$$

$$\Rightarrow \frac{69 + 28\sqrt{5}}{29} = a + \sqrt{5}b \quad (\frac{1}{2})$$

$$\frac{69}{29} + \frac{28\sqrt{5}}{29} = a + \sqrt{5}b$$

$$a = \frac{69}{29}, \quad b = \frac{28}{29} \quad \{ \frac{1}{2} \}$$

OR

$$x = 3 + 2\sqrt{2}$$

$$\frac{1}{x} = \frac{1}{3 + 2\sqrt{2}} \times \frac{3 - 2\sqrt{2}}{3 - 2\sqrt{2}} = \frac{3 - 2\sqrt{2}}{9 - 8} = 3 - 2\sqrt{2} \quad \{ \text{lm} \}$$

$$x^2 = (3 + 2\sqrt{2})^2 = 3^2 + 2 \times 3 \times 2\sqrt{2} + (2\sqrt{2})^2 \quad \{ \text{lm} \}$$

$$= 9 + 12\sqrt{2} + 8 = 17 + 12\sqrt{2}$$

$$\frac{1}{x^2} = (3 - 2\sqrt{2})^2 = 17 - 12\sqrt{2} \quad \{ \frac{1}{2} \}$$

$$x^2 + \frac{1}{x^2} = 17 + 12\sqrt{2} + 17 - 12\sqrt{2}$$

$$= 34 \quad (\frac{1}{2})$$

e.s

18) i) $\frac{4}{27} = 0.\overline{148} \quad (\frac{1}{2})$
(Non terminating recurring) $(\frac{1}{2})$

ii) $\frac{1}{\sqrt{9 \times 2 \times 2 \times 5}} \quad (\frac{1}{2})$
 $= \frac{1}{3 \times 2 \sqrt{5}} = \frac{1}{6\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$

R.F = $\sqrt{5}$ $(\frac{1}{2})$

iii) $(\sqrt{11} + 2\sqrt{7})(3\sqrt{11} - \sqrt{7})$
 $(3 \times 11) - \sqrt{77} + 6\sqrt{77} - (2 \times 7) \quad (1m)$
 $= 33 + 5\sqrt{77} - 14 \quad (\frac{1}{2}m)$
 $= 19 + 5\sqrt{77}$ $(\frac{1}{2}m)$

OR

Let $x = 5.\overline{23} \quad \text{--- (1)} \quad (\frac{1}{2})$

$100x = 523.\overline{23} \quad \text{--- (2)} \quad (\frac{1}{2})$

(2) - (1)

 $99x = 518 \quad (\frac{1}{2})$

$x = \frac{518}{99} \quad (\frac{1}{2})$
 $\frac{518}{99}$

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15) $3x + 3x + 2x = 16$ (1/2)

$8x = 16$
 $x = 2$

$a = 3 \times 2 = 6$ $AB = 4 \text{ cm}$
 $b = 3 \times 2 = 6$ $AC = 6 \text{ cm}$ } (1/2)
 $c = 2 \times 2 = 4$

ii) $16 \times 15.75 = 252$ (1/2)
(1/2)

iii) $P = 50 + 50 + 80 = 180$ (1/2)
 $S = 90$

$A = \sqrt{90 \times 40 \times 40 \times 10}$ (1/2)
 $= 100 \times \sqrt{9 \times 4 \times 4}$
 $= 100 \times 3 \times 4$
 $= 1200 \text{ m}^2$ (1/2)

$\frac{1}{2} \times 80 \times h = 1200$
 $h = \frac{1200}{40} = 30 \text{ cm}$ (1/2)

OR.

$S = 16 \frac{1}{2} = 8 \text{ cm}$ (1/2)

$A_{\text{req}} = \sqrt{8(8-6)(8-6)(8-4)}$ (1/2)
 $= \sqrt{8 \times 2 \times 2 \times 4}$
 $= 4 \times 2\sqrt{2}$ (1/2)
 $= 8\sqrt{2} \text{ cm}^2$ (1/2)