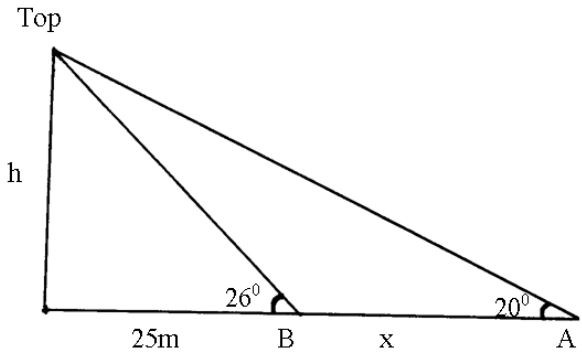


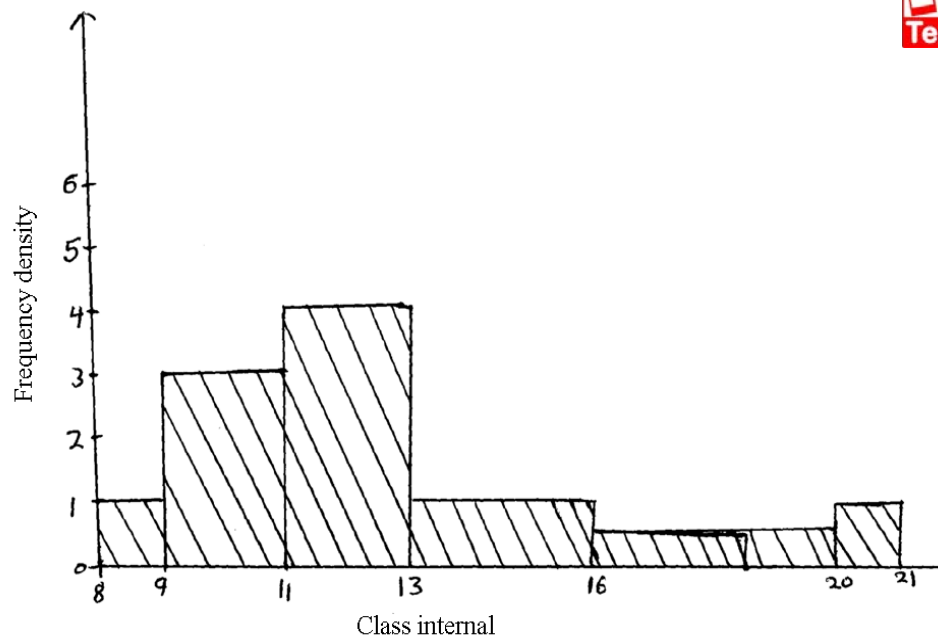
MARKING SCHEME

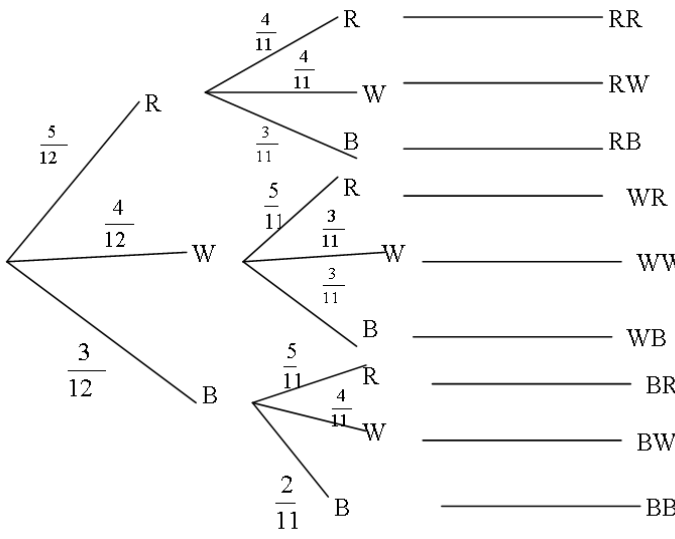
1.	$\sqrt[3]{\frac{119 \times 256}{68 \times 7 \times 1000}}$ $\sqrt[3]{\frac{64}{1000}} = \frac{4}{10}$ $= \frac{2}{5}$	M1 M1 A1	✓ removal of decimal and simplification ✓ cube root C.A.O.
		3	
2.	<p>Share of elder boy = $\frac{4}{9}x$</p> <p>Share of younger boy = $\frac{2}{5}\left(\frac{5}{9}x\right)$</p> $= \frac{2}{9}x$ <p>Girls share =</p> $x - \left(\frac{4}{9}x + \frac{2}{9}x\right)$ $= \frac{3}{9}x$ $= \frac{1}{3}x$ <p>% share of younger boy to girls share</p> $= \left(\frac{2}{9}x \div \frac{1}{3}x\right) \times 100$ $= \frac{2}{9} \times \frac{3}{1} \times 100$ $= 66.67\% \text{ or } 66\frac{2}{3}\%$	B1 B1 M1 A1	
		4	


3.	 <p> $h = 25 \tan 26^\circ$ $= 12.1933$ </p> <p> $\frac{h}{25+x} = \tan 20^\circ$ $h = (25+x)\tan 20^\circ$ $12.19 = 25 \tan 20^\circ + x \tan 20^\circ$ $x = \frac{12.1933 + 25 \tan 20^\circ}{\tan 20^\circ}$ $= \frac{12.1933 - 9.0993}{\tan 20^\circ}$ $= \frac{3.094}{\tan 20^\circ}$ $= 8.501m$ </p>	B1 M1 A1	<p>✓ height</p> <p>for equation in x</p> <p>✓ solution</p>
		3	
4.	$5 < 2x^2 < 35$ $2.5 < x^2 < 17.5$ $1.581 < x < 4.183$ 2,3,4	B1 B1 B1	<p>Removal of fraction or equivalent</p> <p>✓ Square roots</p> <p>✓ integral values</p>
5.	<p>Overtaking speed (Relative speed) $= 80\text{km/h} - 40\text{km/h} = 40\text{km/h}$</p> <p>Distance = $60\text{m} + 20\text{m}$ $= 80\text{m}$</p> <p>$\frac{80}{1000} = 0.08\text{km}$</p> <p>Time take = $0.08 \times \frac{1}{40}$ $= 0.002\text{hrs}$ $= 7.2\text{seconds}$</p>	M1 M1 A1	<p>✓ distance</p> <p>Expression for time</p>
		3	


6.	Let no. be XY \therefore product XY = 20-----(i) Reversed no YX $\Rightarrow (10y+x)-(10x+y)=9$ -----(ii) $\Rightarrow 9y-9x=9$ $y-x=1$ $\Rightarrow y=1+x$ Substitution in (i) we've $x(1+x)=20$ $x+x^2=20$ $x^2+x-20=0$ $x^2+5x-4x-20=0$ $x(x+5)-4(x+5)=0$ $(x+5)(x-4)=0$ $\therefore x=-5$ or $x=4$	M1	✓ Formation of the two equation
7.	(a) $(x-5)^2+(y-5)^2=5^2$ $x^2-10x+25+y^2-10y+25=25$ $x^2-10x+y^2-10y+25=0$ (b) Grad PQ = $\frac{8-5}{7-5} = \frac{3}{2}$ (c) grad of the tangent at Q = $\frac{-2}{3}$ Let (x,y) be any other point on it $\Rightarrow \frac{y-8}{x-7} = \frac{-3}{2}$ $3y - 24 = -2x + 14$ $2x + 3y = 38$	B1 B1 M1 A1	
8.	Area of A = $\frac{1}{2} \times 4 \times 15 = 30\text{cm}^2$ Area of B = $\frac{1}{2} \text{QR} \times 15$ $\frac{1}{2} \text{QR} \times 15 = 30$ QR = 4cm Area of C = $\frac{1}{2} \text{ST} \times \text{PR}$ $= \frac{1}{2} \text{ST} \times 8 = 30$ ST = 7.5cm $\text{PT}^2 + \text{PR}^2 = \text{TR}^2$ $22.5^2 + 8^2 = \text{X}^2$ $\text{X} = \sqrt{570.25}$ $= 23.88\text{cm}$	B1 B1 M1 A1	
		4	
9.	$(2500 \times 5) + 270(480 - 30 \times 5)$ $= \text{SH. } 101,600$	M1 A1	
		2	

10.	$I = \frac{PRT}{100}$ $= \frac{90,000 \times 13 \times 5}{100 \times 2}$ $= \text{Sh. } 29,250$ $A = (90,000 + 29,250)$ $= \text{SH. } 119,250$	M1 A1 B1	
		3	
11.	$3^{2(t+1)} + 3^{2t} = 30$ $3^{2t} \cdot 3^2 + 3^{2t} = 30$ $3^{2t}(3^2 + 1) = 30$ $3^{2t} \times 10 = 30$ $3^{2t} = 3^1$ $2t = 1$ $t = \frac{1}{2}$	M1 M1 A1	
		3	
12.	$\frac{dy}{dx} = 2x - 2$ $2x - 2 = 4$ $x = 3$ $y = 3^2 - 2(3) + 6$ $= 9 - 6 + 6$ $= 9$ $\therefore \text{point is } (3, 9)$	M1 A1	
		2	
13.	<p>Let 50 shilling notes = x And 20 shilling coins = y</p> $\Rightarrow x = 3y \text{-----(i)}$ $50x + 20y = 3400 \text{-----(ii)}$ <p>Substitute (i) in (ii)</p> $50(3y) + 20y = 3400$ $150y + 20y = 3400$ $170y = 3400$ $y = 20$ $x = 3(20)$ $x = 60$	M1 M1 A1	Formation of both equations ✓ elimination of one unknown Both ✓
		3	
14.	$45 \times 10 = 450$ $45 \times 4 = 180$ <p>Remaining day = 270</p> $\text{No. of days} = \frac{270}{30} = 9 \text{ days}$	M1 M1 A1	
		3	

15.		B1 B1 B1	✓Frequency density ✓bars
		3	
16.	$\begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 21 \\ 34 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}^{-1} \begin{pmatrix} 21 \\ 34 \end{pmatrix}$ $= \begin{pmatrix} 8 \\ 5 \end{pmatrix}$	B1 M1 M1 A1	
		4	

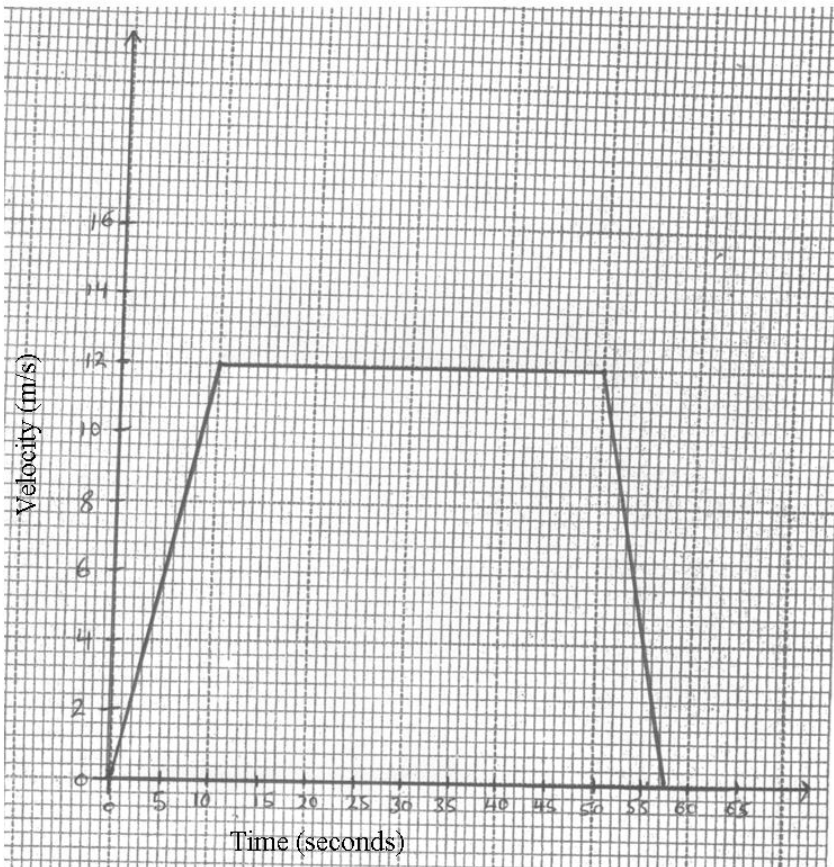
17.	 <p>(b) (i) $P(RR)$ or $P(WR)$ or $P(BR)$</p> $= \frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{5}{11} + \frac{3}{12} \times \frac{5}{11}$ $= \frac{5}{33} + \frac{5}{33} + \frac{5}{44}$ $= \frac{5}{12} \text{ or } 0.4167$ <p>(ii) $P(RR)$ or $P(WW)$ or $P(BB)$</p> $= \frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{2}{11}$ $= \frac{5}{33} + \frac{1}{11} + \frac{1}{22}$ $= \frac{19}{66} \text{ or } 0.2879$ <p>(iii) $P(RB)$ or $P(WB)$ or $P(BR)$ or $P(BW)$ or $P(BB)$</p> $= \frac{5}{12} \times \frac{3}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{5}{11} + \frac{3}{12} \times \frac{4}{11} + \frac{3}{12} \times \frac{2}{11}$ $= \frac{5}{44} + \frac{1}{11} + \frac{5}{44} + \frac{1}{11} + \frac{1}{22}$ $= \frac{5}{11} \text{ or } 0.4545$	<p>B2</p> <p>B1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>M1</p> <p>A1</p>	
		10	

18.	<p>(a) $\angle STQ = \angle PQS = 28^\circ$ (angle in alternate segment)</p> <p>(b) $\angle TQU = \frac{180^\circ - 54^\circ}{2} = 63^\circ$ (base angles of isosceles triangles)</p> <p>(c) $\angle TQS = 63^\circ - 28^\circ = 35^\circ$ ($\angle TUQ$ is alternate to $\angle PQT = 63^\circ$)</p> <p>(d) $\angle UOQ = 54^\circ \times 2 = 108^\circ$ (angle subtended at centre is twice that at circumference by same chord UQ) \therefore Reflex $\angle UOQ = 360^\circ - 108^\circ = 252^\circ$</p> <p>(e) $\angle TQR = \angle TSQ$ $= 180^\circ - (28^\circ + 35^\circ)$ $= 117^\circ$ (angle in alternate segment are equal)</p>	 B1 B1 B1 B1 B1 B1 B1 B1	Reason Angle Reason Reason Angle Angle Reason NB: Accept Alternative reasons which are correct.
		10	
19.	<p>a) $\frac{x-3}{5} + 2\left(\frac{2x}{5}\right) = \frac{9x-15}{5}$</p> <p>$\frac{x+3}{5} + 2\left(\frac{2x}{5}\right) = \frac{9x+15}{5}$</p> <p>$\left(\frac{9x-15}{5}\right)\left(\frac{9x+15}{5}\right) = 315$</p> <p>$x^2 = \frac{8100}{81}$</p> <p>$9x^2 - 15^2 = 7875$</p> <p>$x^2 = 100$</p> <p>$x = \sqrt{100}$</p> <p>$= 10$</p> <p>b) Dancing floor area $= (10-3)(10+3)$ $= 91$ Total floor area $= 15 \times 21 = 315$ Carpeted margin Area $= 315 - 91 = 224\text{m}^2$</p> <p>c) $750 \times 224 = \text{sh } 168,000$</p>	M1 M1 M1 M1 A1 M1 M1 A1 M1A1	For the two expressions For equality the two expressions Removal of fractions and forming quadratic equation
		10	

20.	<p>(a) $\frac{5 \times 25 + 2 \times 30 + 45 \times 1}{8} = 28.75$</p> <p>Profit $28.75 \times \frac{20}{100} = sh.5.75$</p> <p>(b) (i) $New\ Price = \frac{28.75}{100} \times 110 \times \frac{115}{100} = 36.40$</p> <p>(ii) $\frac{28.75 \times 110}{100} = 31.60$</p> <p>New Profit $\frac{45 - 31.60}{31.60} \times 100$</p> <p>$= \frac{13.4}{31.60} \times 100$</p> <p>$= 42.41\%$</p>	M1 A1 M1 A1 M1 M1 A1 M1 M1 A1	
21.	<p>(a)(i) $a = \frac{12 - 0}{10} m/s^2$</p> <p>$= \frac{12}{10}$</p> <p>$= 1.2m/s^2$</p> <p>(ii) $\frac{0 - 12}{-1.5} = \frac{-12}{-1.5}$</p> <p>$= 8sec$</p>	M1 A1 M1 A1	



	(b)		B2
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$$(i) \text{ distance} = \frac{1}{2} \times 12 \times (58 + 40)$$

$$= 588m$$

(ii) 1st 15 seconds

$$\text{dist} = \frac{1}{2} \times 10 \times 12 + 5 \times 12$$

$$= 120m$$

$$\% = \frac{120}{588} \times 100$$

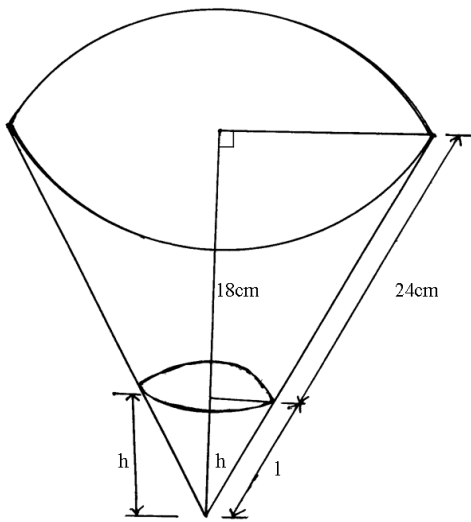
$$= 20.41\%$$

M1
A1

M1
A1

10

22.	(a)		
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$$\frac{h}{h+18} = \frac{2}{5}$$

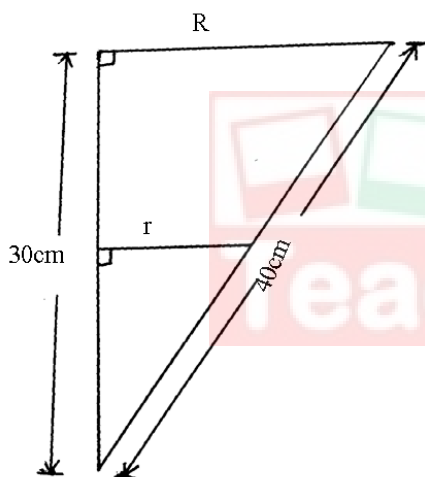
$$L = 12\text{cm}$$

$$\frac{l}{l+24} = \frac{2}{5}$$

$$l = 16\text{cm}$$

B1

B1



$$R^2 = 40^2 - 30^2$$

$$R = \sqrt{700}$$

$$= 26.46\text{cm}$$

$$r = \frac{2}{5} \times 26.46\text{cm}$$

$$= 10.584\text{cm}$$

B1

M1

$$\text{Volume} = \frac{1}{3} \times 3.142 \times 26.46^2 \times 30 - \frac{1}{3} \times 3.142 \times 10.584^2 \times 12$$

$$= (21998.1 - 1407.9)\text{cm}^3$$

$$= 20,590.2\text{cm}^3$$

A1

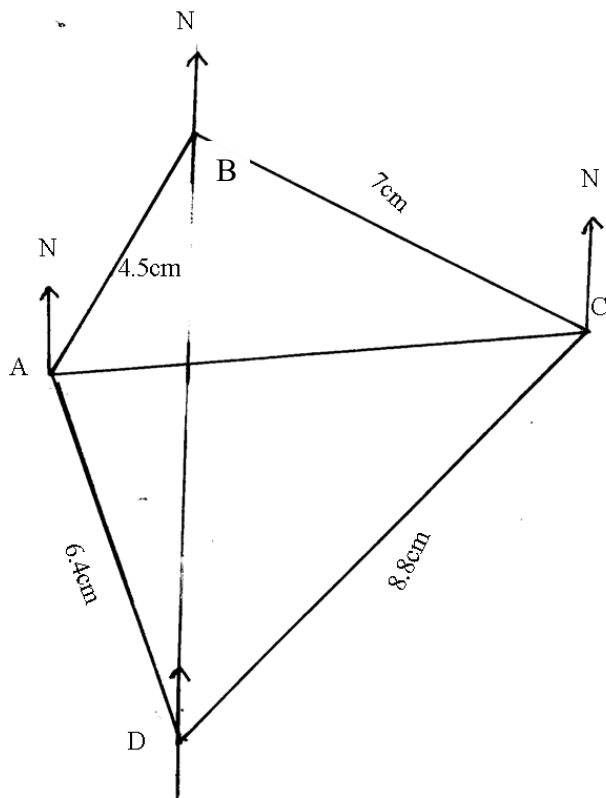
M1

A1

(b) Curved surface area

	$= 3.142 \times 26.46 \times 40 - 3.142 \times 10.584 \times 16$ $= (3325.5 - 532.08) \text{cm}^2$ $= 2793.42 \text{cm}^2$	M1 A1	Teacher.co.ke
		10	
23.	<p>(a) $-(x^2 - 2xy + y^2)$ $-(x^2 - xy - xy + y^2)$ $-x(x-y) - y(x-y)$ $-(x-y)(x-y)$ $-(x-y)^2$ $= -(3)^2$ $= -9$</p> <p>(b) $9x^2 + 3xy + 3xy + y^2$ $3x(3x+y) + y(3x+y)$ $(3x+y)(3x+y)$ $= (3x+y)^2$ $= 17^2$ $= 289$</p> <p>(c) $3x^2 - 3xy + xy - y^2$ $3x(x-y) + y(x-y)$ $(x-y)(3x+y)$ $= 3(17)$ $= 51$</p> <p>(d) numerator $3x^2 - 3xy - xy + y^2$ $3x(x-y) - y(x-y)$ $(x-y)(3x-y)$ Denominator : $(3x+y)(3x-y)$ $\frac{(x-y)(3x-y)}{(3x+y)(3x-y)}$ $= \frac{x-y}{3x+y}$ $= \frac{3}{17}$</p>	M1 A1 M1 A1 M1 M1 A1 M1 M1 A1	Teacher.co.ke
		10	

24.	(a)		
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B1

B1

B1

B1

B1

- (b) (i) $N20^{\circ}W$
 (ii) $542^{\circ}W$

- (c) (i) $6.4 \times 100\text{km} = 640\text{km}$
 (ii) $8.8 \times 100\text{km} = 880\text{km}$

- (d) (i) 300°
 (ii) 268°

B1

B1

B1

B1

10