

FORM TWO TERM ONE EXAM 2017

MATHEMATICS MARKING SCHEME PAPER 1

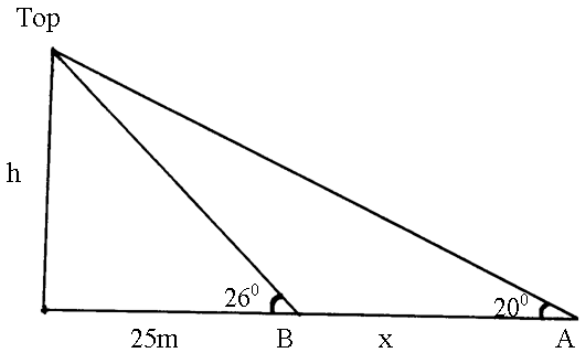
SCHOOLS NET KENYA

Osiligi House, Opposite KCB, Ground Floor
Off Magadi Road, Ongata Rongai | Tel: 0711 88 22 27
E-mail: infosnkenya@gmail.com | Website: www.schoolsnetkenya.com

PAPER 1

MARKING SCHEME

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

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

[illegible]

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

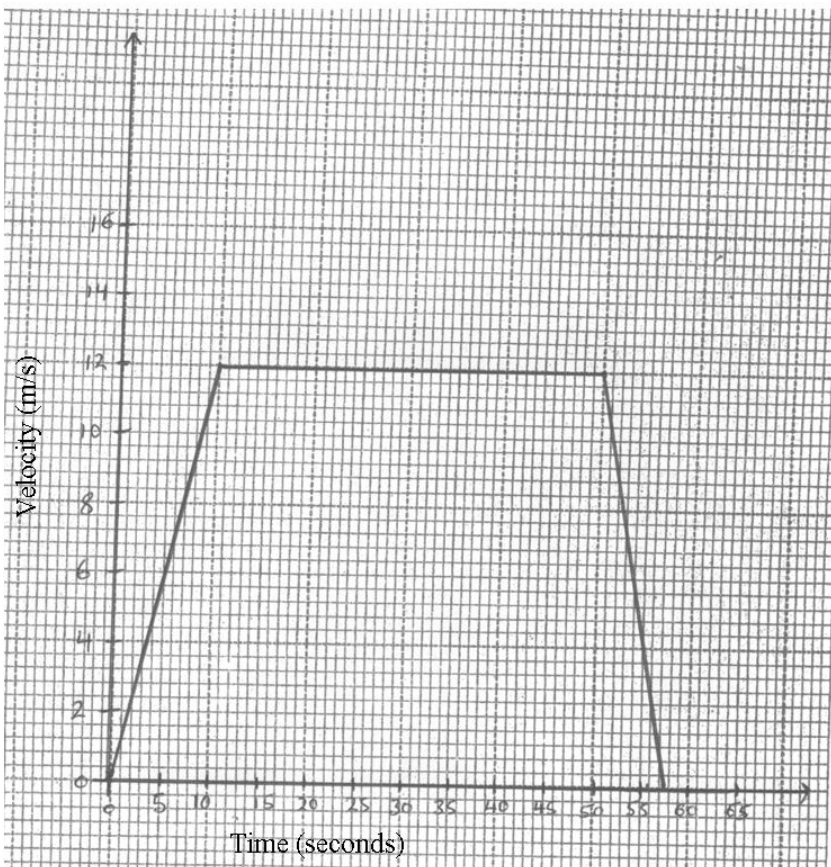
15.	Frequency density Class interval	B1	✓Frequency density
		B1	✓bars
		B1	
		3	
16.	$\begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 21 \\ 34 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 & -1 \\ -3 & 2 \end{pmatrix}^{-1}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

17.	(b) (i) $P(RR)$ or $P(WR)$ or $P(BR)$ $= \frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{5}{11} + \frac{3}{12} \times \frac{5}{11}$ $= \frac{5}{33} + \frac{5}{33} + \frac{5}{44}$ $= \frac{5}{12} \text{ or } 0.4167$ (ii) $P(RR)$ or $P(WW)$ or $P(BB)$ $= \frac{5}{12} \times \frac{4}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{2}{11}$ $= \frac{5}{33} + \frac{1}{11} + \frac{1}{22}$ $= \frac{19}{66} \text{ or } 0.2879$ (iii) $P(RB)$ or $P(WB)$ or $P(BR)$ or $P(BW)$ or $P(BB)$ $= \frac{5}{12} \times \frac{3}{11} + \frac{4}{12} \times \frac{3}{11} + \frac{3}{12} \times \frac{5}{11} + \frac{3}{12} \times \frac{4}{11} + \frac{3}{12} \times \frac{2}{11}$ $= \frac{5}{44} + \frac{1}{11} + \frac{5}{44} + \frac{1}{11} + \frac{1}{22}$ $= \frac{5}{11} \text{ or } 0.4545$	B2 B1 M1 A1 M1 A1 M1 M1 A1	10
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18.	(a) $\angle STQ = \angle PQS = 28^\circ$ (angle in alternate segment) (b) $\angle TQU = \frac{180^\circ - 54^\circ}{2} = 63^\circ$ (base angles of isosceles triangles) (c) $\angle TQS = 63^\circ - 28^\circ = 35^\circ$ ($\angle TUQ$ is alternate to $\angle PQT = 63^\circ$) (d) $\angle UOQ = 54^\circ \times 2 = 108^\circ$ (angle subtended at centre is twice that at circumference by same chord UQ) $\therefore$ Reflex $\angle UOQ = 360^\circ - 108^\circ = 252^\circ$ (e) $\angle TQR = \angle TSQ$ $= 180^\circ - (28^\circ + 35^\circ)$ $= 117^\circ$ (angle in alternate segment are equal)	B1 B1 B1 B1 B1 B1 B1 B1	Angle Reason Angle Reason Angle Angle Reason NB: Accept Alternative reasons which are correct.
		10	
19.	a) $\frac{x-3}{5} + 2\left(\frac{2x}{5}\right) = \frac{9x-15}{5}$ $\frac{x+3}{5} + 2\left(\frac{2x}{5}\right) = \frac{9x+15}{5}$ $\left(\frac{9x-15}{5}\right)\left(\frac{9x+15}{5}\right) = 315$ $x^2 = \frac{8100}{81}$ $9x^2 - 15^2 = 7875$ $x^2 = 100$ $x = \sqrt{100}$ $= 10$ b) Dancing floor area $= (10-3)(10+3)$ $= 91$ Total floor area $= 15 \times 21 = 315$ Carpeted margin Area $= 315 - 91 = 224\text{m}^2$ c) $750 \times 224 = \text{sh } 168,000$	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.	(a) $\frac{5 \times 25 + 2 \times 30 + 45 \times 1}{8} = 28.75$ Profit $28.75 \times \frac{20}{100} = sh.5.75$ (b) (i) $New Price = \frac{28.75}{100} \times 110 \times \frac{115}{100} = 36.40$ (ii) $\frac{28.75 \times 110}{100} = 31.60$ New Profit $\frac{45 - 31.60}{31.60} \times 100$ $= \frac{13.4}{31.60} \times 100$ $= 42.41\%$	M1 A1 M1 A1 M1 M1 A1 M1 M1 A1	
21.	(i) $a = \frac{12 - 0}{10} m/s^2$ $= \frac{12}{10}$ $= 1.2 m/s^2$ (ii) $\frac{0 - 12}{-1.5} = \frac{-12}{-1.5}$ $= 8 \text{ sec}$	M1 A1 M1 A1	

(b)			
		B2	



(i) $distance = \frac{1}{2} \times 12 \times 68 \times 40$
 $= 588m$

(ii) 1st 15 seconds

$dist = \frac{1}{2} \times 10 \times 12 + 5 \times 12$
 $= 120m$

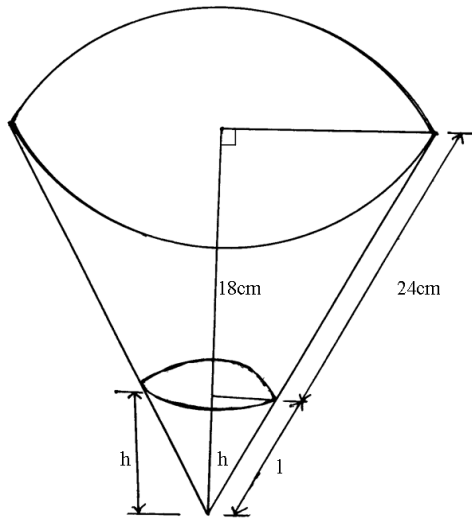
$\% = \frac{120}{588} \times 100$
 $= 20.41\%$

M1
A1

M1
A1

10

22. (a)

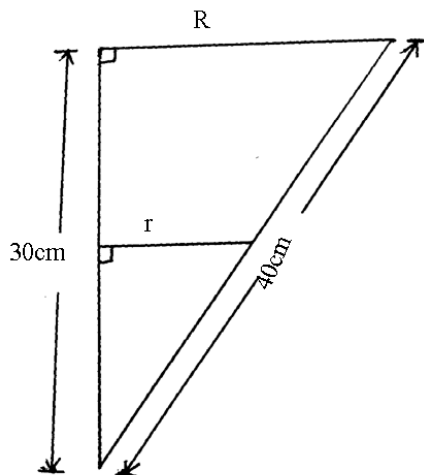


$$\frac{h}{h+18} = \frac{2}{5}$$

$$L = 12cm$$

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

$$l = 16cm$$



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

$$R = \sqrt{700}$$

$$= 26.46cm$$

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

$$= 10.584cm$$

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

$$= (1998.1 - 1407.9) cm^3$$

$$= 20,590.2cm^3$$

B1

B1

B1

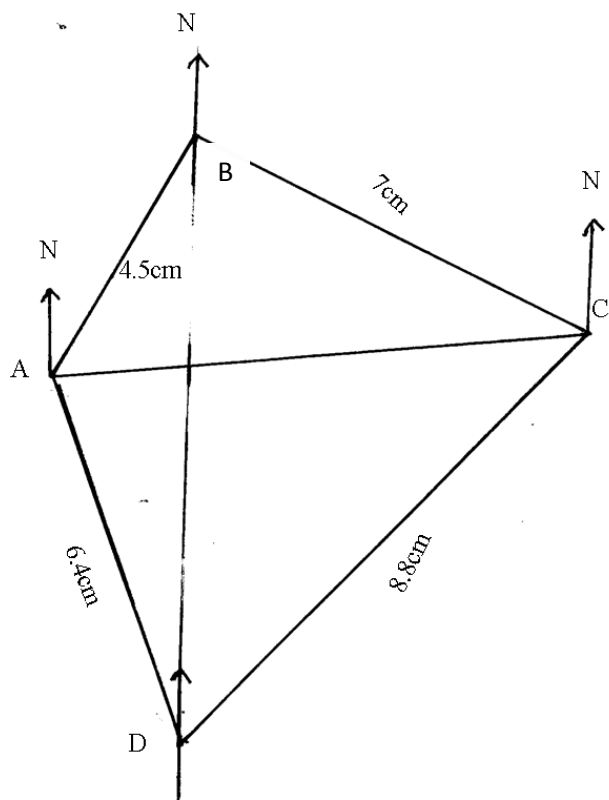
M1

A1

M1

A1

(b) Curved surface area



- (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

B1

B1

B1

10