KENYA NATIONAL EXAMINATION COUNCIL
REVISION MOCK EXAMS 2016
TOP NATIONAL SCHOOLS

PRECIOUS BLOOD HIGH SCHOOL

MATHEMATICS

PAPER 1

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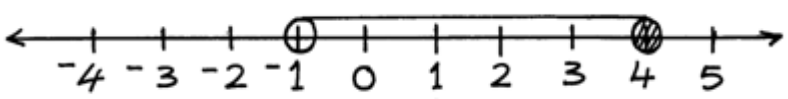
PRECIOUS BLOOD KCSE TRIAL AND PRACTICE EXAM 2016

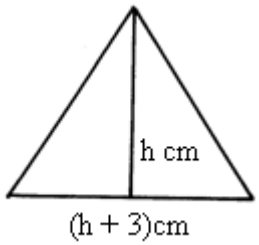
PAPER 1

MARKING SCHEME

1	$\sqrt{\frac{38X\,23X\,27X100}{114X\,575}}$ $\sqrt{\frac{38X\,23X\,27X100}{114X\,575}}\ \sqrt{36}$ $= \pm 6$	M_1 M_1 A_1	Removing the decimals Division Correct square root
		03	
2	$y = (a+b)(x-c)^2$ $y = (6+6)(3-2)^2$ $y = (12)(5)^2$ $=11x25$ $=275$	M_1 M1 A1	Correct substitution
		03	
3	$3-2x<5$ $-2x<2$ $x>-1$ .....(i) $4-3x\geq -8$ $-3x\geq -12$ $x\leq 4$ .....(ii) $-1<x\leq 4$  	B1 B1 A1	Check on in equality symbols Correct illustration
		03	
4	$\sqrt{\frac{1}{2.456x10^1}}+4.346^2$ $\sqrt{10^{-1}(0.4072)+18.88}$ $\sqrt{18.92872}$ 4.3509	M1 M1	Correct reciprocal square

	4.351 ?(4 significant figure)	M1 A1	Correct square root Correct significant figures
		04	
5.	Amount in ksh. 20,000 x 147.56 = 2,951,200 Balance ksh. 2,951,200 – 2,510,200 = 441000 Into US dollars $\frac{441000}{74.50}$ = 5919.46 = 5919 US dollars.	M1 M1 A1	
		03	
6.	1,2,3,4,4,5,6,6,7,7,8,9 $Q \Rightarrow \frac{1}{4} \times 12$ = 3rd and 4th positions Q_1 = 3.5 Q_3 = 3.5 $Q_3 \Rightarrow \frac{3}{4} \times 12$ 9th and 10th positions Q_3 = 7 $QD = \frac{1}{2}(Q_3 - Q_1) = \frac{1}{2}(-3.5) = \frac{3.5}{2}$ $= 1.75$		
		03	

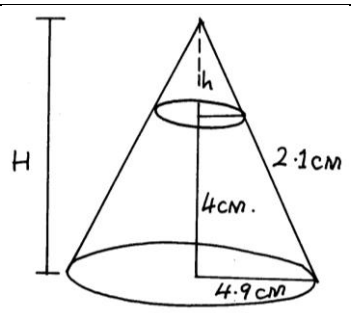
7.	$Q=\begin{pmatrix}6\\3\end{pmatrix}; \underset{\sim}{R}=\begin{pmatrix}-4\\2\end{pmatrix}; \underset{\sim}{U}=\begin{pmatrix}8\\-4\end{pmatrix}$ $S \xrightarrow{Q} T$ $\underset{\sim}{T} \xrightarrow{R} U$ $Object + Translation\ vector = image\ vector$ $T=\begin{pmatrix}8\\-4\end{pmatrix}-\begin{pmatrix}-4\\2\end{pmatrix}=\begin{pmatrix}12\\-9\end{pmatrix}$ $\underset{\sim}{S}=\begin{pmatrix}12\\-6\end{pmatrix}-\begin{pmatrix}6\\3\end{pmatrix}=\begin{pmatrix}6\\-9\end{pmatrix}$ $co-ordinator\ of\ S=(6,-9)$	M1 M1 A1	Column vector for T Column vector for S Co- ordinate
		03	
8.	Mid point of CD $\left(\frac{-7+3}{2}, \frac{8-8}{2}\right)=(-2,0)$ Gradient of C $\frac{-3-8}{3+7}=\frac{-16}{10}=\frac{-8}{5}\Rightarrow G_1$ $G_1G_2=-1$ $\frac{-8}{5}G_2=-1\Rightarrow G_2=\frac{5}{8}$ $Equation \quad \frac{y}{x+2}=\frac{5}{8}$ $8y=5x+10$ $y=\frac{5}{8}x+\frac{5}{4}$	B1 M1 A1	Correct G_2 Any of the two equatius
		04	
9.	M.P		

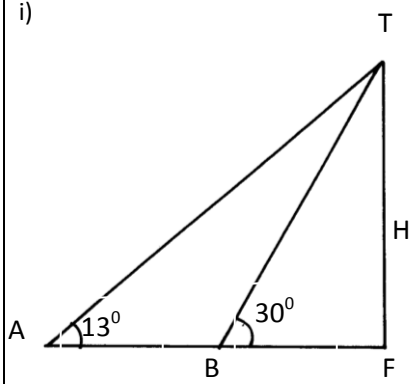
	80 % = 160 100% = $\frac{100\times160}{80}$ =200 Sp = 160% B.p = ? 130% = 160 100% = $\frac{100\times160}{130} = Kshs123.08$ $\%\ profit\left(\frac{200-123.08}{123.08}\right)100$ 62.50%	M1 M1 A1	
		03	
10.	 $\frac{1}{2}\times(h+3)h=35$ $h_2+3h-70=0$ $h_2-7h10h-70=0$ $h(h-7)10(h-7)=0$ $(h-10)(h-7)=0$ $h=-10\,or\,7$ $h=7\,cm$	B1 A1	
		03	
11.	$2(3x-4)-3(2x-1)=6-5x$ $12x-8-6x+3=6-5x$ $11x=11$ $x=1$	M1 A1	
		02	
12.	$\frac{30}{360}\times\frac{22}{7}\times r^2-\frac{1}{2}r^2\sin30^0=5.25$ $\frac{1}{42}r^2-\frac{1}{4}r^2=5.25$ $\frac{1}{84}r^2=441$ $r=\pm21cm$ $r=21cm$	M1 M1 A1	
		03	

13.	Let the number be xy $10x + y = 5(x + y)$ $10x - y = 5x + 5y$ $5x - 4y = 0$.....(i) $(10y + x) - (10x + y) = 9$ $x - y = -1$.....(ii) $solving two equations simultaneously$ $x - y = -1$ $5x - 4y = 0$ $5x - 5y = -5$ $5x - 4y = 0$ $y = 5$ $x = -1 + 5 = 4$ $xy = 45$ $The number is 45$	M1 M1 A1	Equals Solving equations
		03	
14.	Area scale factor (Asf) = $\frac{12}{108} = \frac{1}{9}$ Linear scale factor (L.s.f) = $\sqrt{\frac{1}{9}} = \frac{1}{3}$ Volume scale factor (V.s.f) = $\left(\frac{1}{2}\right)^3 = \frac{1}{27}$ $27 = 810\,cm^3$ $1 = \left(\frac{310 \times 1}{27}\right) = 30cm^3$ $volume of small cone = 30cm^3$	M1 M1 A1	Correct scale factors
		03	
15.	Let the exterior angle be x $x = 180 - x$ $x = \frac{1}{3}(80 - x)$ $3x = 180 - x$ $< x = 180$ $x = 45^0$ $\frac{360}{n} = 45$ $45n = 360$ $n = 8\,sides$ The polygon is an octagon	M1 M1 B1	
		03	

	$\frac{1}{3}\left\{\frac{(80(n-2)}{n}\right\}=\frac{360}{n}$ $180n-360=1080$ $n=8$ The polygon is octatogon.	M1 M1 B1	
		03	
16.	$\frac{1}{3}\Rightarrow food$ $\frac{1}{4}\Rightarrow rent$ $remainder 1-\left(\frac{1}{4}+\frac{1}{3}\right)=\frac{5}{12}$ $Transport=\frac{3}{5}\times\frac{5}{12}=\frac{1}{4}$ $Spent\ \frac{1}{3}+\frac{1}{4}+\frac{1}{4}=\frac{5}{6}\Rightarrow 1800$ $He\ saved\frac{1}{6}$ $\frac{5}{6}=1800$ $\frac{1}{6}=\frac{1}{6}\times 1800\times\frac{6}{5}$ $=360$	B1 M1 A1	

17.a)	Cost price of the mixture Ksh.(25 x 5 + 30 x 2 + 45 x1) = ksh. 230 Selling price $\left(\frac{120\times 230}{100}\right)=ksh276$ Total kgs = 5 + 2 + 1 = 8 Profit per kg of the mixture $\left(\frac{276-230}{8}\right)$ Ksh. 5.76	M1 M1 M1 A1	For cost price For selling price
b)	(i) the cost price after one year $\frac{112}{100}\times 230=ksh257.60$ $profit\Rightarrow\frac{120}{100}\times 257.60=309.12$ $\frac{ksh309.12}{8}=38.64$ Price per kg of the mixture = kshs. 38.60 ii) 40.25 – 32.2 = ksh. 8.05	M1 M1 A1 M1 M1	Profit Price per kg

	% profit = $\frac{8.05}{32.2}\times 100$ 25%	A1	
		10	
18.a)	 $\frac{4+h}{h}=\frac{4.9}{2.1}$ $4.9h = 3.4 + 2.1h$ $2.8h = 3.4$ $h = 3cm$ $H = 3+4 = 7cm$	M1 A1	
b)	Surface area $(\Pi RL - \Pi rl) + \Pi r^2 + 2\Pi R^2$ $L^2 = 4.9^2 + 7^2$ $= 24.01 + 49 = 73.01$ $L = 8.54cm$ $l^2 = 2.1^2 + 3^2 = 4.41 + 9 = 13.41$ $l = 3.66cm$	M1 M1 M1 A1	
	$3.142(4.9\times 8.54) + (2.1\times 3.66) + 2.1^2 + (2\times 4.9^2)$ $3.142(41.846 - 7.686 + 4.41 + 48.02)$ $= 3.142\times 86.59 \setminus 272.07cm^2$	M1 M1 M1 A1	
		10	
19.a)	Area of the floor = $\frac{1960}{70} = 28m^2$ Let the other length be y $xy = 28m^2$ $y = \frac{28}{x}m$	M1 A1 B1	

b)	New area = $(x-1)\left(\frac{28}{x}-1\right)m^2$ $\cos t = 70(x-1)\left(\frac{28}{x}-1\right)m^2$ $1960-70\left(28-x-\frac{28}{x}+1\right)=700$ $1960-1960+70x+\frac{1960}{x}-70=700$ $70x^2+190-70x=700x$ $70x^2-770x+1960=0$ $x^2-11x+28=0$	M1 M1 M1 B1	
c)	$x^2-11^2+28=0$ $x^2-7x-4x+28=0$ $x(x-7)(x-7)=0$ $x=7\,or\,4$ *Dimensionsare* *length*$=7\,cm\,when\,x\,is\,7$ *width*$=4\,cm\,when\,x\,is\,7$	M1 B1 A1	All correct All correct
		10	
20.a)	i)  	M1	

	$\frac{H}{x} = \tan 30^0$ $H = x\tan 30^0$ $\frac{H}{120+x} = \tan 13^0$ $H = (20+x)\tan 13^0$ $but\ H = H$ $x\tan 30^0 = (20+x)\tan 13^0$ $0.5774x = 0.2309(20+x)$ $0.574x = 27.708 + 0.2309x$ $0.3465x = 27.708$ $x = 79.97M$ $H = 79.97\tan 30^0$ $= 46.17M$	M1 M1 M1 A1	
	ii) $\frac{46.17}{TB} = \sin 30^0$ 0.5TB = 46.17 TB = 92.3AM	M1 A1	
b)	$\tan 105^0 = \sin 30^0$ $\tan 15^0 = \frac{1}{2+\sqrt{3}}$ $\frac{2-\sqrt{3}}{4-3} = \frac{2-\sqrt{3}}{1}$ $2-\sqrt{3}$	M1 M1 A1	
		03	

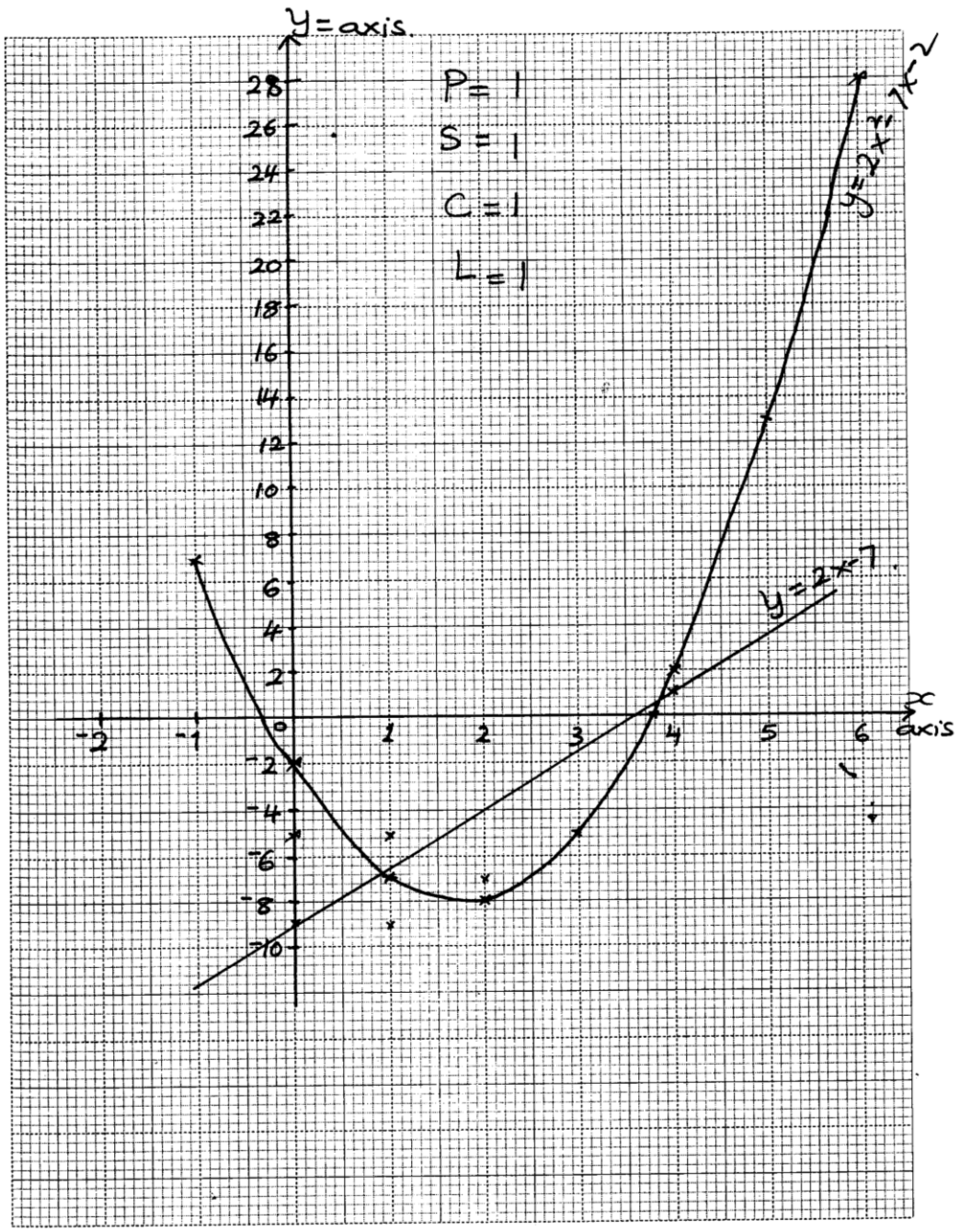
21.a)	<table><tr><td>x</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>y</td><td>7</td><td>-2</td><td>-7</td><td>-8</td><td>-5</td><td>2</td><td>13</td><td>28</td></tr></table> Correct scale Correct plotting Smooth curve	B1 B1 B1 B1 B1	Correct values
b)	The roots of the function $2x^2 - 7x - 2 = 0 \quad are$ $x = -0.3 \pm 0.1$ $x = 3.8 \pm 0.1$	B1	All values correct

c)	Y = 2x – 7 P	B1	Table

X	0	2	3	4
y	-7	-3	-1	1

B1 B1 Correct values of x

B1 Correct line graph.

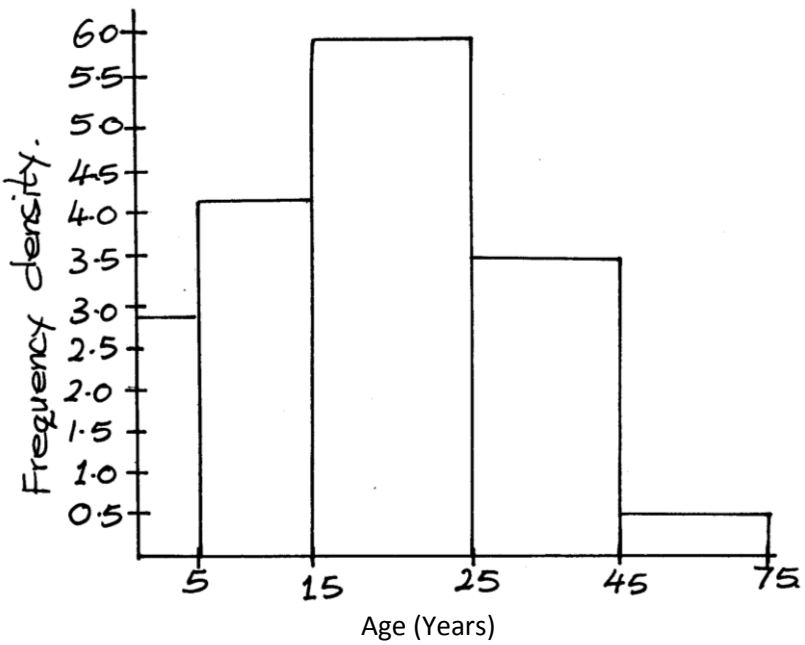


Maths 121/1

M/ scheme

From the graph the values of x are

	$x = 0.65 \pm 0.05$ $x = 3.85 \pm 0.05$		
		10	
22.a)	Person a lane All working takes $\frac{5}{3} hrs$ In 1 hr they do $\frac{3}{5}$ of the job Work done in 40 mins = $\frac{2}{3}$ hrs $\frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$ of the job Assume A lane takes a hours B alone b hrs and C a lone $\frac{40}{9}$ hrs. When B left $\frac{2}{5}$ had been done $\therefore$ A and C worked for 1/3 hrs hence did $\frac{1}{3}\left(\frac{1}{9} + \frac{9}{40}\right) = \frac{1}{39} + \frac{3}{40}$ A lone did $\frac{1}{9}\left(\frac{53}{30}\right) = \frac{53}{309}$ hence Completing the job $\frac{2}{5} + \frac{1}{39} + \frac{3}{40} + \frac{53}{309} = 1$ $\frac{63}{309} = \frac{21}{40}$ $= a = 4$		
b)	Person B alone $\frac{1}{4} + \frac{1}{b} + \frac{9}{40} = \frac{3}{5}$ $\frac{1}{b} = \frac{1}{8}$ $\therefore b\, alone takes 8 hrs$		
c)	Person A and C alone $\frac{1}{4} + \frac{9}{40} = \frac{19}{40}$ $in one hour$ $\therefore take \frac{40}{19} = 2\frac{2}{19} hrs$		
		10	
23.	i) <CDE = 180-<CBE = 180-80 = 100^0 (Opposite angles of cyclic quadrilators) ii) <EDF = 180 – 100 = 80^0 (<S of a straight line) <DEF = 180 – 110 = 70^0 (<S on a straight line) <DFE = 180 – (30 + 70) = 80^0 (some of angles of a triangle)	B1 B1	

	iii) Obtuse angle COE = = 80 x 2 = 160^0 (angle subtended at the centre is twice angle subtended at the circumference by the same chord) iv) <ADE = <ABE = 400 <S subtend by the same chord to the circumfrence. v) <CAE = $\frac{1}{2}$ COE = $\frac{1}{2}\times 160 = 80^0$ angle subtended at the centre is twice the one subtended by the same chord on the circumference.	B1 B1 B1B1 B1B1 B1 B1	
		10	
24.	a) Age (years) | x | F | xf 0-5 | 2.5 | 14 | 35 5-15 | 10 | 41 | 410 15-25 | 20 | 59 | 1180 25-45 | 35 | 70 | 2450 45-75 | 60 | 15 | 900 | | $\sum f = 199$ | $\sum fx = 4975$ $Mean\left(\bar{x}\right) = \frac{\sum fx}{\sum f} = \frac{4975}{199} = 25 yrs$	B1 B1 M1 A1	
	i)  	B1 B1 B1B1	Frequency density Age (years) Scale

		B1 B1	Correct heigh Correct internals of the bars.