

## S 4 TEST 1 2018

1.	Express as single logarithms: i) $2\log 5 + 2\log 2 + \log 16 - 2\log 4$ ii) $\frac{1}{2}\log 16 + \frac{1}{3}\log 8 + \log 5 + \log \frac{5}{2}$
2.	Express as single logarithms: $\log 24 - \frac{1}{2}\log 9 + \log 125$
3.	Without using tables or calculators, evaluate $\log 120 - 2\log 6 + \frac{1}{3}\log 27$ .
4.	Rationalise $\frac{3 - \sqrt{3}}{2 + \sqrt{3}}$ .
5.	Given that $p$ is inversely proportional to the <b>cube root</b> of $x$ and $p = 5$ when $x = 27$ , find the value of $p$ when $x = 125$ .

6.	Simplify: $3\log_{10} 5 + 5\log_{10} 2 - \frac{1}{2}\log_{10} 16$ .
7.	Solve for $y$ : $\left(\frac{1}{81}\right)^{-2y} \times 3^y = 243$ .
8.	Factorise completely; $2xy^2 - 32x^3$ .
9.	Given $f(x) = \frac{3x+1}{2x^2 - 5x + 3}$ , find the value(s) of $x$ for which $f(x)$ is <b>not</b> defined.
10.	Find the equation of a line passing through the point $(2, 3)$ and is parallel to the line $5x - 4y = 10$ .

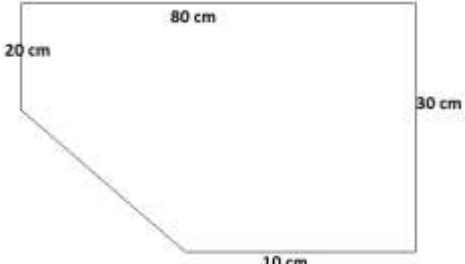
## S 4 TEST 2 2018

1.	Given that $\log_{10} 3 = 0.4771$ , $\log_{10} 5 = 0.6990$ and $\log_{10} 7 = 0.8451$ , evaluate: (i) $\log_{10} 105$ (ii) $\log_{10} 225$
2.	Evaluate: $\frac{3\frac{1}{2} - 1\frac{5}{6} \times \frac{3}{11}}{1\frac{3}{4} + 7\frac{2}{3} \div 3\frac{5}{6}}$
3.	Given $135_n = 75_{ten}$ , find $n$ .
4.	Given that $f(x) = x^2 + 3$ and $g(x) = 3x + 6$ , find $gf(2)$ .
5.	Make $p$ the subject of the formula, $T = 2\pi\sqrt{\frac{p}{g}}$ , hence find $p$ , given $T = 4\pi$ , $g = 10$

6.	Given that $f(x) = 3x - 5$ and $h(x) = 25 - 2x$ , find the value of $x$ for which $hf(x) = 12$ .
7.	Two similar jugs have heights of 21cm and 14cm. The smaller jug has an area of $2.5 \text{ cm}^2$ . Find the area of the big jug.
8.	Solve the simultaneous equations; $2x - 3y = 0$ $x + 2y = 7$
9.	Find the equation of the line passing through the point $(2, 3)$ and $(-4, 9)$ .
10.	Solve for $y$ in the given equation: $\frac{y-3}{5} - \frac{y-7}{2} = \frac{5}{4}$ .

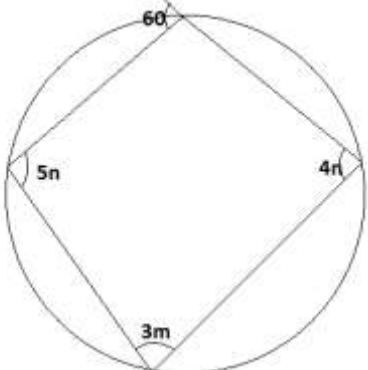
### S 4 TEST 3 2018

1.	Solve for $x$ : $4^x = 0.5$
2.	Form an equation whose roots are $\left\{-\frac{3}{5}, \frac{5}{6}\right\}$ .
3.	Given $P = \begin{pmatrix} 2 & 8 \\ -5 & -6 \end{pmatrix}$ and $Q = \begin{pmatrix} 3 & 7 \\ 5 & -3 \end{pmatrix}$ , find $\det(PQ)$ .
4.	Simplify: $\sqrt{1000} - \sqrt{40} - \sqrt{90}$
5.	Simplify: $\frac{27^{\frac{1}{2}} \times 243^{\frac{1}{2}}}{243^{\frac{4}{5}}}$ .

6.	Solve using matrices. $x - y = 3$ $3x + y = 5$
7.	Evaluate: $\frac{\frac{3}{4} + 1\frac{5}{7} \div \frac{4}{7}}{\left(1\frac{3}{7} - \frac{5}{8}\right) \times \frac{2}{3}}$ of $2\frac{1}{3}$
8.	Make $b$ the subject given $a = \frac{bd}{\sqrt{b^2 - d}}$ .
9.	Find the area of the figure below. 
10.	Given $\begin{pmatrix} -2 \\ -5 \end{pmatrix} + 3\mathbf{r} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$ , find the coordinates of the point $R$ .

## S 4 TEST 4 2018

1.	Calculate the simple interest on shs. 10,000 for $3\frac{1}{2}$ years at 14% per annum.
2.	The angle of a sector of a circle radius 3 cm is $65^\circ$ . Calculate the area of the sector.
3.	Convert to 12 hour system. 0500hours..... 1730hours..... Convert to 24 hour system. 12:30pm ..... 2: 00 am.....
4.	Evaluate: $\log_2 \frac{4}{7} + \log_2 \frac{3}{2} - \log_2 \frac{3}{14}$ .
5.	Use tables to evaluate: $\sqrt{0.43 \times 0.00786}$

6.	Express in the form $p + r\sqrt{q}$ . $\frac{3}{\sqrt{3} + \sqrt{2}} + \frac{2}{\sqrt{3} - \sqrt{2}}$
7.	The sum of interior angles of a polygon is $1080^\circ$ , find the number of sides of the polygon.
8.	The point $P(2, 3)$ is given a translation $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ , find the coordinates of its image $R$ .
9.	Find the values of $m$ and $n$ . 
10.	Show that the points $P(1, 3)$ , $Q(2, 1)$ and $R(3, -1)$ are collinear.



## S 4 TEST 5 2018

1.	Solve using matrices. $3x + 2y - 3 = 0$ $x = 11 + 6y$
2.	Solve the equation $\frac{x-4}{x+5} = \frac{x+3}{x-6}$ .
3.	Without using tables or calculator, evaluate $\frac{65.49^2 - 34.51^2}{0.3098}$ .
4.	Given the point $P(-6, 14)$ and $\overrightarrow{QP} = \begin{pmatrix} 4 \\ 9 \end{pmatrix}$ , determine the coordinates of Q.
5.	A rectangle with area $270\text{cm}^2$ is the image of the rectangle with area $30\text{cm}^2$ . If the object triangle measures 8cm by 3.75cm, find the dimensions of the larger (image) rectangle.

6.	Solve the equation: $\log_{10}(10x + 50) - \log_{10}(x - 4) = 2$ .
7.	Given that $12 \tan \theta = 5$ , without using tables or a calculator, determine the value of $2 \cos \theta - 5 \sin \theta$ .
8.	The cost of 3 shirts and a pair of trousers is shs. 22,000 and the cost of 2 shirts and 4 pairs of trousers is shs. 37,000. Find the cost of each item.
9.	Make $t$ the subject in the formular $P = \frac{n}{2m} \sqrt{\frac{F}{k-t}}$ .
10.	Solve for $x$ in the equation; $\frac{2x-5}{3} - \frac{3x-1}{4} = \frac{3}{2}$ .



6.	Without using tables or calculators, simplify $\frac{(0.125)^2 \times \left(\frac{1}{16}\right)^2}{(64)^{-3}}$ .
7.	Given that $f(x) = 2x^2 + 1$ and $g(x) = 2x - 4$ , find the values of $x$ for which $gf(x) = 0$ .
8.	Evaluate $\frac{\sqrt{32}}{\sqrt{2}} + \frac{\sqrt{75}}{\sqrt{3}}$ .
9.	At a certain company, three bells A, B and C are always rang on Tuesday at exactly 08:00 am. They are rang at intervals of 75, 100 and 125 minutes respectively. When will all the bells be rang again?
10.	A map has a scale of 1: 125,000. The area of a farm on the map is $6.25\text{cm}^2$ . What is the actual area of the farm in $\text{km}^2$ ?

### S 4 TEST 7 2018

1.	Given that $2.\overline{13} = a\frac{b}{c}$ , hence, state the values of a, b and c.
2.	Given that the matrix $A = \begin{pmatrix} m+1 & m \\ 2 & 3 \end{pmatrix}$ is singular. Find the value of $m$ .
3.	For $\tan \theta = -\frac{12}{5}$ and $\theta$ is obtuse. Find the value of $3\sin \theta - 4\cos \theta$ .
4.	If $\mathbf{OA} = \begin{pmatrix} 12 \\ 16 \end{pmatrix}$ and $\mathbf{OB} = \begin{pmatrix} 4 \\ 1 \end{pmatrix}$ , Evaluate for $ \mathbf{AB} $ .
5.	Given that $a \Delta b = a^2 + b^2$ . Find the value of $y$ if $y \Delta 2\sqrt{10} = 7 \Delta 4$ .

6.	Simplify $\left(\frac{27}{64}\right)^{\frac{-2}{3}} \times \left(\frac{3}{27^{\frac{1}{2}}}\right)^{-2}$
7.	Given that $f(z) = \frac{1}{1+z}$ and $g(z) = 2z$ . Find the value of $z$ for which $fg(z) = gf(z)$ .
8.	Use logarithms to evaluate $\frac{0.000768}{0.34 \times 0.00965}$ .
9.	A certain amount of money was shared between ratios: Tom: James and John in the ratio: 2:3:6 respectively. If John got shs. 28,000 more than tom. How much did James get?
10.	It's given that $y$ varies inversely as the square root of $x$ and that when $y = \frac{1}{2}$ , $x = 100$ . Find the value of $y$ when $x = 25$ .

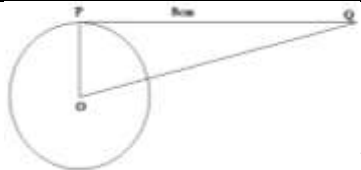
## S 4 TEST 8 2018

1.	Use logarithms to evaluate, $\sqrt{0.0056 \times 0.459}$
2.	Given $A = \begin{pmatrix} 2 & 3 \\ 4 & 2 \end{pmatrix}$ $B = \begin{pmatrix} 6 & -2 \\ 7 & 3 \end{pmatrix}$ , Find $(A - 2B)^{-1}$ .
3.	Use matrix method to solve the equations: $\begin{aligned} 3x - 5y &= -9 \\ 2y + 5x &= 16 \end{aligned}$
4.	Evaluate $\frac{\sqrt{50}}{\sqrt{2}} - \frac{\sqrt{600}}{\sqrt{24}}$ without using tables or calculator.
5.	The function $h$ is defined as $h(x) = \frac{4x-3}{x^2-16}$ . Find $h(-3)$ and the values of $x$ for which $h(x)$ is meaningless.

6.	Given that $a * b = \frac{1}{3}(b^2 - 2a)$ , evaluate $-7 * (5 * -2)$ .
7.	$P$ varies as $Q$ and inversely proportional to the square of $R$ , given that $P = 3$ when $R = 2$ and $Q = 6$ , find the value of $Q$ when $P = -2$ and $R = -3$ .
8.	The line through the points $A(1, 3)$ and $B(-3, -5)$ is perpendicular to the line through $Q(1, -4)$ . Determine the equation of the line through $Q$ .
9.	Edward wanted to exchange Kenyan shillings $Ksh$ 540,000 to Tanzanian shillings ( $TZsh$ ). It is given that $1 Ug sh = 1.8 TZsh$ and $1 Ksh = 25 Ugsh$ . Calculate how much ( $TZsh$ ) Edward got.
10.	Given that $f^{-1}(x) = \frac{3x}{4x - 5}$ , find $f(x)$ and hence $f(5)$



## S 4 TEST 9 2018

1.	<p>If <math>h(x) = nx + m</math>, and <math>h(4) = 19</math> and <math>h(5) = 22</math>, find <math>n</math> and <math>m</math>.</p>
2.	<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>In the figure above, angle <math>OQP = 40^\circ</math>, find the length <math>OQ</math> and <math>OP</math> given <math>PQ = 8 \text{ cm}</math>.</p> </div> </div>
3.	<p>Without using tables or calculator, find the value of <math>\log \frac{81}{32}</math> given that <math>\log 2 = 0.301</math> and <math>\log 3 = 0.4771</math>.</p>
4.	<p>Given that P varies directly as fourth root of Q and <math>P = 4</math> when <math>Q = 16</math>. Find the value of Q when <math>P = 2</math>.</p>
5.	<p>The domain <math>\{-3, -2, 2, 3\}</math> is mapped on to the function <math>g(x) = 2 - 8x^2</math>, determine the range and state the type of mapping.</p>

6.	Solve: $\frac{4x-1}{3} - \frac{3x-1}{2} \leq \frac{5-2x}{4}$ .
7.	Given that $f(x) = \frac{3x+1}{8x^2-18}$ , find the values of $x$ for which $f(x)$ is not defined.
8.	The points $P(-2, 5)$ , $Q(k, 3)$ and $R(4, 8)$ lie on a straight line, find $k$ .
9.	Solve for $x$ : $\frac{5^{x+1}}{125} = \frac{5^{2x}}{5^{1-x}}$ .
10.	Form an equation whose roots are $\left\{-2\frac{2}{3}, 4\frac{1}{3}\right\}$ .

## S 4 TEST 10 2018

1.	Simplify: $\frac{1}{x+3} - \frac{1}{x-2}$ .
2.	Factorise completely: $3x^2 - 12y^2$
3.	5 painters can finish a job in 48 days. Given that all the painters work at the same rate, find the number of additional painters needed to finish the job 18 days earlier.
4.	Solve the inequality and show the solution on a number line. $2x + 3 > \frac{7x + 6}{4} \geq 3x - 6$
5.	Solve the simultaneous equations: $2x + 3y = 2$ $4x - y = 18$

6.	If the simple interest on shs. 3,200,000 for 6 months is shs. 40,800, find the interest rate per annum.
7.	Given that $\tan \theta = \frac{8}{15}$ and $\theta$ is acute, find the value of $51\sin \theta - 34\cos \theta$ .
8.	The perimeter of a rectangular swimming pool is $84m$ . If the width is $\frac{3}{4}$ of the length, find the dimensions of the pool and hence the area.
9.	At Dan's automobile shop, 50 cars were inspected, 23 of the cars needed new brakes, 34 needed new exhaust system and 6 needed neither repair. How many needed both?
10.	Solve: $2^{x+1} \times 2^{3x+2} = 128$

## S 4 TEST 11 2018

1.	Given that $p * q = \frac{1}{3}(p^2 - 2q)$ , evaluate: $-7 * (5 * -2)$ .
2.	Use matrix method to solve: $\begin{matrix} 3x + 9 = 5y \\ 2y + 5x = 16 \end{matrix}$
3.	Factorise completely, $(2x + 5)^2 - (x - 3)^2$ , hence solve $(2x + 5)^2 - (x - 3)^2 = 0$
4.	Given $P = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ , $Q = \begin{pmatrix} 4 & 5 \\ 6 & 7 \end{pmatrix}$ find the matrix $R$ , such that $2Q - 3P = 2R$ .
5.	Given that $(x + y) : (x - y) = 8 : 3$ , find the ratio of $x : y$ .

6.	A man pays no income tax on the first shs. 230,000 of his monthly salary. On each of shs. 10,000 above this, he pays shs. 2,500. If he pays shs. 30,000 tax, what is the monthly salary?
7.	Find the equation of a line whose $x$ -intercept is $-4$ and $y$ -intercept is $5$ .
8.	In a school of 450 students, the ratio of girls to boys is $5:4$ . Find the number of boys. If 50 more girls join the school, what is the new ratio of boys to girls?
9.	Solve: $303_n = 410_{six}$ .
10.	The two sides of a square are $(2x + 3)m$ and $(4x - 9)m$ , find the value of $x$ hence, the area of the square.