

# MATHEMATICS

## S2 HOLIDAY PACKAGE JANUARY 2018

### WEEK ONE

1. If  $x:y = 2:3$ , find the value of  $x$  and  $y$  if  $x + y = 50$ .
2. Solve the equation  $\frac{2(x-1)}{5} - \frac{3x-2}{4} + \frac{13}{10} = 0$
3. The ages of five boys are  $y, 7y, 2y, 3y$  and  $4y$ . If the median age is 9 years, find the difference between the ages of the youngest and the eldest boys.
4. Convert  $345_{\text{six}}$  to base three.
5. (a) If  $P = \frac{ab+1}{b-a}$  and  $a = \frac{2}{3}, b = \frac{4}{5}$ , find  $P$  in its simplest form.  
(b) Express in three digit form the following bearings; (i) ESE (ii)  $N27^{\circ}W$  (iii)  $S39^{\circ}W$

### WEEK TWO

1. The scores obtained by ten students in a test were 40, 80, 70, 65, 85, 100, 55, 80, 48, and 20. Find the median, mean and modal scores.
2. The RF of a map is  $\frac{1}{250000}$ . Find the area of a lake on the map whose actual area is  $20\text{km}^2$  on the ground.
3. Express 500gm as a percentage of 0.25tonnes
4. Given that  $3^{4x} \times 5^{2x-y} = 225$ , find the values of  $x$  and  $y$ .
5. Tap A fills a tank in 12 minutes, tap B fills the same tank in 15 minutes but tap C empties the tank in only 10 minutes. If the tank has a capacity of 60,000litres, find; (i) how much water is put in the tank by tap A in 8 minutes  
(ii) how much water is put in the tank by taps A and B in 3 minutes.  
(iii) how long the tank will take to be filled when all the three taps are left open.

### WEEK THREE

1. Given that  $m : p : n = 1 : 4 : 5$ , find the value of  $p$  if  $m + p + n = 300$ .
2. Peter spent money on clothes, food and travel in the ratio 3:2:5. If he spent 100,000 on travel, how much money did he have at first?
3. The interior angle sum of a regular polygon is  $1440^{\circ}$ . Calculate its; (i) number of sides (ii) Centre angle (iii) Interior angle.
4. Construct a regular Decagon whose sides measure 2.5cm long. Measure its radius and calculate the area and circumference of its circum-circle
5. Twenty triangles are cut off from a regular polygon. Calculate the; (i) number of sides of the polygon (ii) Interior angle sum of the polygon (iii) Center angle of the polygon (iv) Interior angle of the polygon.

### WEEK FOUR

1. Find the square root of each of the following using the prime factor method  
 (i)  $1\frac{24}{25}$  (ii) 5.76
2. A triangle ABC is such that  $AB = (9 - 2x)\text{cm}$ ,  $AC = (3x - 6)\text{cm}$  and  $BC = (x + 10)\text{cm}$ . If  $AB = AC$ , find the value of  $x$  and the perimeter of the triangle.
3. The numerator of a fraction  $\frac{3}{4}$  is increased by  $x$  and the denominator by  $2x$ . If the new fraction is  $\frac{2}{3}$ , find the value of  $x$ .
4. (a) Given that  $a+b+c=120$  and  $a:b:c = 5:6:9$ , find the values of  $a$ ,  $b$  and  $c$ .  
 (b) If  $\frac{3x-5y}{x-y} = \frac{5}{3}$ , find the ratios (i)  $x:y$  (ii)  $x^2:y^2$  (iii)  $(2x+y)^2 : (3x-y)^2$
5. Using ruler and compasses only, (i) Construct an acute angled triangle ABC such that  $\angle ABC = 45^\circ$ ,  $BC = 9 \text{ cm}$  and  $AC = 7 \text{ cm}$ .  
 (ii) Locate a point X in triangle ABC such that X is equidistant from A, B and C and use it to draw a circle touching A, B and C. Measure AX, AB and  $\angle AXC$ .  
 (iii) Measure the radius of the circle and use it to find the area and circumference of the drawn circle.

**END**