THE PRESIDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

BASIC MATHEMATICS MARKING SCHEME

1. (a) (i) 3,5,7,11,13,17,19 and 23 **01$\frac{1}{2}$ marks**

Sum = 3+5+7+11+13+17+19+23
= 98 **01$\frac{1}{2}$ marks**

(ii) $+ \times - = -$ **01 mark**
$- \times + = -$ **01 mark**
The product is negative.
$- \times - = +$ **01 mark**
∴The last sign obtained was positive

(b) Let $x = 0.\dot{2}\dot{4}$
$100x = 24.\dot{2}\dot{4}$
$99x = 24$ **02 marks**
$X = \frac{24}{99}$
$X = \frac{8}{33}$
$X\% = \frac{8}{33} \times 100$
$\therefore \% = \frac{800}{33}\% \; or \; 24.24\%$ **02 marks**

2. (a) (i) $0.0\dot{7}\dot{5}\dot{4} \approx 0.07545$ (4 s.f) **02 marks**

(ii) $0.0\dot{7}\dot{5}\dot{4} \approx 0.0755$ (4 d.p) **02 marks**

(b) $20.025 \approx 20.02$ (to hundredths) **02 marks**

(c) Given 30min = $60x$ 30 sec=1800sec
1hr = 3600sec **02 marks**
Total seconds= (3600+1800) sec
= 5400sec
∴ She took 5400 seconds to complete the whole cooking **02 marks**

3. (a) In $\Delta\, PTS$

$$80° + 80° + z = 180°$$
$$160° + z = 180°$$
$$z = 20°$$

In $\Delta\, QPR$

$$20° + 90° + \hat{QPR} = 180°$$
$$110° + \hat{QPR} = 180°$$

$\hat{QPR} = 70°$ **02marks**

$70° + y = 180°$

$70° + y = 180°$

$y = 110°$

In $\Delta\, PRS$
$20° + y + x = 180°$
$20° + 110° + x = 180°$

$x = 180° - 130°$ **02marks**

$x = 50°$

$\therefore x = 50° \; and \; y = 110°$ **01mark**

(b) Given radius =20 cm

Required circumference **01mark**

$C = 2\pi r$
$C = 2\times 3.14\times 20cm$
C= $125.6cm$ **02marks**
L= 3C
L= 3(125.6cm)
L= 376.8 cm
Therefore the Cow will round 376.8cm for three times. **02marks**

P = $4\times 5cm$

4. (a) $A = A_1 - A_2$ **01 mark**

$A = lw$

$62 = ((2x + 3)(x - 1)) - ((x - 1)(x - 2))$

$62 = (2x^2 + x - 3) - (x^2 - 3x + 2)$

$62 = x^2 + 4x + 5$

$x^2 + 4x - 57 = 0$

$a = 1,\ b = 4\ and\ c = 57$ **01mark**

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-4 \pm \sqrt{4^2 - 4 \times 1 \times -57}}{2 \times 1}$

$x = \frac{-4 \pm \sqrt{16 + 228}}{2}$

$x = \frac{-4 \pm \sqrt{244}}{2}$

$x = -2 \pm \sqrt{61}$ **01mark**

$D = P_1 - P_2$

$D = 2((L + W) - (L + W))$

$L1 = 2x + 3$

$L1 = 2(-2 + \sqrt{61}) + 3$ or $L1 = 2(-2 - \sqrt{61}) + 3$

$L1 = -4 + 2\sqrt{61} + 3$ *or* $L1 = (-4 - 2\sqrt{61}) + 3$

$L1 = -1 + 2\sqrt{61}$ or $L1 = -1 - 2\sqrt{61}$

$L2 = x - 1$

$L2 = -2 + \sqrt{61} - 1$ or $L2 = -2 - \sqrt{61} - 1$

$L2 = -3 + \sqrt{61}$ or $L2 = -3 - \sqrt{61}$

$W1 = x - 1$

$W1 = -3 + \sqrt{61}$ or $W1 = -3 - \sqrt{61}$

$W2 = x - 2$

$W2 = -2 + \sqrt{61} - 2$ or $W2 = -2 - \sqrt{61} - 2$

$W2 = -4 + \sqrt{61}$ or $W2 = -4 - \sqrt{61}$ **02marks**

There is no negative distance therefore will consider only positive values.

$D = 2((L1 + W1) - (L2 + W2))$

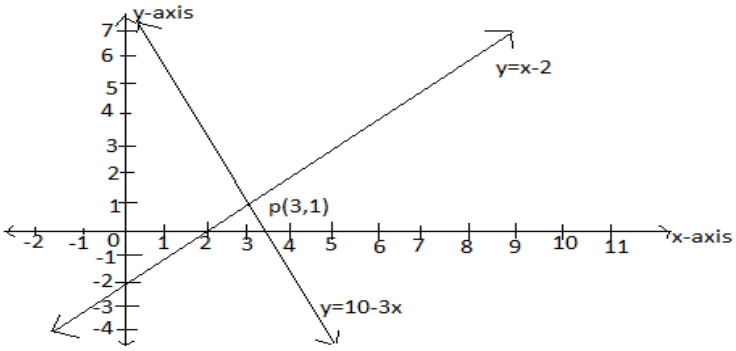
$D = 2((-1 + 2\sqrt{61} + \sqrt{61} - 3)—(-4 + \sqrt{61} + \sqrt{61} - 3))$

$D = 2(-3 + \sqrt{61})$

$\therefore D = -6 + 2\sqrt{61}$ cm **01mark**

(b) $x - y = 2$ and $3x + y = 10$

x	0	1	2	3	4	5
y=x-2	-2	-1	0	1	2	3
y=10-3x	10	7	4	1	-2	-5



03 marks

The solution is $x = 3 \; and \; y = 1$

01mark

5. (a) Given

% loss = 12%

Loss made =720

Required Selling price for 20%

From Buying price $= \frac{loss\ made \times 100}{percentage\ loss}$

Buying price = $\frac{720 \times 100}{12}$ **02marks**

$B.P = 60 \times 100$

$B.P = 6,000$

Buying price $= \frac{profi\ made \times 100}{percentage\ profit}$

$6000 = \frac{profi\ made \times 100}{20}$

Profi made = 1200 **02marks**

Selling price = buying price + profit made
Selling price = 6000 + 1200
= 7200

∴The selling price is 7200shillings. **02marks**

(b) Given a:b=5:2 and b:c=3:4,
Required a:b:c.
a:b=5:2
b:c=3:4
Multiply the value b for both equation by interchanging **01mark**
a:b=15:6
b:c=6:8
Therefore a:b:c= 15:6:8 **03marks**

6. (a) Given that $2x - 4y + 6 = 0$; $(x_1,y_1) = (2,3)$
Write $y = mc + c$;
$y = \frac{1}{2}x + \frac{3}{2}$ **01mark**

$m = \frac{1}{2}$

$m = \frac{y-y_1}{x-x_1}$ **01mark**

eqn: $y = m(x - x_1) + y_1$ but $(x_1,y_1)=(2,3)$

$y = \frac{1}{2}(x - 2) + 3$

$y = \frac{1}{2}x - 1 + 3$

$y = \frac{1}{2}x + 2$ **02marks**

Therefore y-intercept is 2 and x-intercept is -4 **01mark**

(b) (i) Given that image $=(x - y, x)$; $(x, y) = (6, -2)$

$(x', y') = (6 -- 2, 6)$

$\therefore (x', y') = (8, 6)$ **02marks**

(ii) Given
A(3,2) A$^{|}$(6,4)
Let (x,y) be the image centre of enlargement
Let (x",y") be the image
Let (x' ,y') be the point

Then $K = \frac{x-x''}{x-x'}$

$2 = \frac{x-6}{x-3}$

$2(x-3) = x - 6$

$2x - 6 = x - 6$

$X = 0$

Then $K = \frac{y-y''}{y-y'}$

$2 = \frac{y-4}{y-2}$

$2(y-2) = y-4$

$2y- 4 = y-4$ $y =0$

$(x,y) = (0,0)$

$\therefore$the centre of enlargement is (0,0) **03marks**

7. (a) R.F $= 2 - \sqrt{3}$ **01mark**

$\frac{\sqrt{2}}{2+\sqrt{3}} = \frac{\sqrt{2}(2-\sqrt{3})}{2+\sqrt{3}(2-\sqrt{3}}$

$= \frac{(2\sqrt{2}+\sqrt{6})}{4-3}$

$= 2\sqrt{2} - \sqrt{6}$ **02marks**

$\therefore p = 2, q = 2, r = 6 \; and \; s = 1$ **02marks**

(b) $\log (2x + 1) + \log 4 = \log (7x + 8)$

$\log (2x + 1) + \log 4 - \log (7x + 8) = 0$

$\log \frac{4(2x+1)}{(7x+8)} = 0$

$\frac{4(2x+1)}{(7x+8)} = 10^0$

$\frac{4(2x+1)}{(7x+8)} = 1$ **03marks**

$8x + 4 = 7x + 8$

$8x - 7x = 8 - 4$

$\therefore x = 4$ **02marks**

8. (a) Given that AB=BDand AC =DC

Required to show that triangles **ABC** and **DBC** are congruent.

AB= BD (Given) 01 **marks**

AC= DC (Given) 01 **marks**

BC (Common line to both triangle) $01\frac{1}{1}$ **marks**

$\Delta ABC \cong \Delta DBC$ (by SSS) $01\frac{1}{1}$ **marks**

(b) Given that $\Delta ABC \approx \Delta KLC$, BC=15cm, AC= 18cm and KC= 12cm,

$\frac{BC}{AC} = \frac{LC}{KC} = \frac{KL}{AB}$ **01mark**

$\frac{15cm}{18cm} = \frac{LC}{12cm}$

LC= $\frac{15cm \times 12cm}{18cm}$

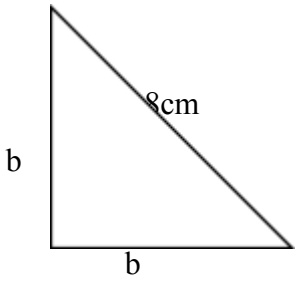
LC= 10cm **02marks**

BL= BC-LC

BL= 15cm-10cm

BL= 5cm **02marks**

9. (a) There is enough information to find the length of the adjacent sides. **01mark**



By use of Pythagoras theorem

$a^2 + b^2 = c^2$

$(b)^2 + b^2 = 8^2$

$2b^2 = 8^2$

02marks

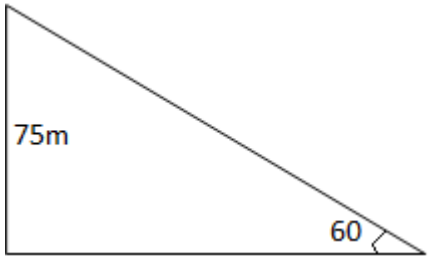
$b^2 = 32$

$b = \sqrt{32}$

$b = 4\sqrt{2}cm$ **01mark**

∴ The length of adjacent side is $4\sqrt{2}cm$ **01mark**

(b) Given height 75m and angle of elevation = 60˚



01mark

From Sin 60˚=$\frac{op}{hyp}$

Sin 60°= $\frac{75m}{hyp}$ **01mark**

Hyp = $\frac{75m}{Sin\,60^{\circ}}$

Hyp = $\frac{75m}{\frac{\sqrt{3}}{2}}$ **01mark**

Hyp = $50\sqrt{3}cm$ or 86.61cm **01mark**

Therefore the length of the string is $50\sqrt{3}cm$ or 86.61cm **01mark**

10. (a) (i) Number of students who like football $= 4\times7$

$= 28$

Therefore there are 28 students who like football **01mark**

(ii) Number of students who like basketball $= 3\times7$

$= 21$

Therefore there are 21 students who like basketball only **02marks**

(iii) Number of students who do not like football $= 4\times5$

$= 20$

Therefore there are 20 students who do not like football **02marks**

(b) Given ; Daresalaam = 150°

Dodoma $= \frac{1}{4}\times360^{\circ} = 90^{\circ}$ **01mark**

Morogoro $= 360^{\circ} - (90^{\circ} + 150^{\circ}) = 120^{\circ}$ **01mark**

Now;

$\frac{120^{\circ}\times y}{360^{\circ}} = 460$

$y = \frac{360^{\circ}\times460}{120^{\circ}}$

$y = 1380$ **02marks**

∴ There are 1380 candidates sat for examination **01mark**