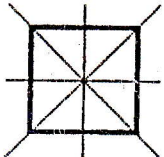


# YEAR 2013 WORKING AND ANSWERS

1	$\begin{array}{r} 2,045 \\ 1,055 \\ + 900 \\ \hline 4,000 \end{array}$	2	$\begin{array}{r} 3,000 \rightarrow \text{Three thousand} \\ + 5 \rightarrow \text{five} \\ \hline 3,005 \rightarrow \text{Three thousand, five} \end{array}$	3	$\begin{aligned} &= (200 \div 10) + \left(\frac{4}{100} \times 100\right) \text{dag} \\ &= 20\text{dag} + 4\text{dag} \\ &= 24\text{dag} \end{aligned}$								
4	$\begin{aligned} \text{Angle } a &= 180^\circ - (110^\circ + 30^\circ) \\ &= 180^\circ - 140^\circ \\ &= 40^\circ \end{aligned}$	5	$\begin{aligned} &= \frac{84}{100} \times 25 \\ &= 21 \end{aligned}$	6	$\begin{aligned} &= \frac{3}{7} \times \frac{14}{9} \\ &= \frac{2}{3} \end{aligned}$								
7	$\begin{aligned} 3m &= 5 + 4 \\ 3m &= 9 \\ \frac{3m}{3} &= \frac{9}{3} \\ m &= 3 \end{aligned}$	8	$\begin{array}{cccccc} 1, & 4, & 9, & 16, & 25 \\ (1 \times 1) & (2 \times 2) & (3 \times 3) & (4 \times 4) & (5 \times 5) \end{array}$	9	$\begin{aligned} \text{Total parts} &= 3 + 7 = 10 \\ &= \frac{3}{10} \times 10,000\text{Rwf} = 3,000\text{Rwf} \\ &= \frac{7}{10} \times 10,000\text{Rwf} = 7,000\text{Rwf} \end{aligned}$								
10	$\begin{aligned} &= 100\% - 20\% \\ &= 80\% \\ &= \frac{80}{100} \times 200\text{kg} \\ &= 160\text{kg} \end{aligned}$	11	$\begin{aligned} P &= 2(L + W) \\ 40\text{cm} &= 2(12 + x) \\ 40\text{cm} &= 24\text{cm} + 2x \\ 2x &= 40\text{cm} - 24\text{cm} \\ \frac{2x}{2} &= \frac{16\text{cm}}{2} \\ x &= 8\text{cm} \end{aligned}$	12	$\begin{aligned} 2\text{kg} &= 620\text{Rwf} \\ 1\text{kg} &= (620 \div 2)\text{Rwf} \\ 8\text{kg} &= \left(\frac{620}{2} \times 8\right)\text{Rwf} \\ 8\text{kg} &= 2,480\text{Rwf} \end{aligned}$								
13	<p>Let that number be <math>x</math></p> $\begin{aligned} &= 100\% + 20\% = 120\% \\ \frac{120}{100} \times x &= 2,400 \\ 120x &= 2,400 \times 100 \\ \frac{120x}{120} &= \frac{2,400 \times 100}{120} \\ x &= 2,000 \end{aligned}$	14	<table border="1" style="margin-bottom: 10px;"> <tr> <td>4</td> <td>7</td> <td>6</td> <td><math>x</math></td> </tr> <tr> <td>9</td> <td><math>y</math></td> <td>13</td> <td>21</td> </tr> </table> $\begin{aligned} 2x + 1 &= y & 2x + 1 &= y \\ 2 \times 7 + 1 &= y & 2x + 1 &= 21 \\ 14 + 1 &= y & 2x &= 21 - 1 \\ 15 &= y & \frac{2x}{2} &= \frac{20}{2} \\ & & x &= 10 \end{aligned}$	4	7	6	$x$	9	$y$	13	21	15	$\begin{aligned} V &= S \times S \times S \\ &= 5\text{cm} \times 5\text{cm} \times 5\text{cm} \\ &= 125\text{cm}^3 \\ D &= \frac{M}{V} \\ &= \frac{200\text{g}}{125\text{cm}^3} \\ &= 1.6\text{g/cm}^3 \end{aligned}$
4	7	6	$x$										
9	$y$	13	21										
16	<table border="1" style="margin-bottom: 10px;"> <tr> <td>3</td> <td>12</td> <td>15</td> <td>21</td> </tr> <tr> <td></td> <td>4</td> <td>5</td> <td>7</td> </tr> </table> <p>HCF = 3 (only 3 can divide all the three numbers at once)</p>	3	12	15	21		4	5	7	17	Teacher's guidance	18	$\begin{aligned} P &= \text{SP} - \text{CP} \\ &= 3,900,000\text{Frw} - 3,000,000\text{Frw} \\ &= 900,000\text{Frw} \\ \%P &= \frac{P}{\text{CP}} \times 100 \\ &= \frac{900,000}{3,000,000} \times 100 \\ &= 30\% \end{aligned}$
3	12	15	21										
	4	5	7										
19	$\begin{aligned} &= \frac{5}{4} \times \frac{16}{15} \\ &= \frac{4}{3} \\ &= 1\frac{1}{3} \end{aligned}$	20	$\begin{aligned} C &= 2\pi r \\ &= 2 \times 3.14 \times 5\text{cm} \\ &= 31.4\text{cm} \end{aligned}$	21	$\begin{aligned} &= axb + 2xaxc \\ &= 1 \times 2 + 2 \times 1 \times 3 \\ &= 2 + 6 \\ &= 6 - 2 \\ &= 4 \end{aligned}$								
22	<p>A square has 4 lines of symmetry.</p> 	23	$\begin{array}{r} 1\text{h} = 60\text{min} \\ \text{Minutes} \\ 60 + 12 = 72 \\ 72 - 50 = 22 \\ \text{Hours} \\ 2 - 1 = 1 \\ 1 - 1 = 0 \end{array}$ $\begin{array}{r} 1\text{h} \quad 7\text{ 2min} \\ - 2\text{h} \quad 12\text{min} \\ \hline - 1\text{h} \quad 50\text{min} \\ \hline 0\text{h} \quad 2\text{ 2min} \end{array}$	24	$\begin{aligned} &= \frac{2\text{ litres}}{500\text{ml}} \\ &= \frac{(2 \times 1,000)\text{ml}}{500\text{ml}} \\ &= 4\text{ bottles} \end{aligned}$								

$$D = Li \times Ni$$

$$4,500 = 50(Np - 1)$$

$$4,500 = 50Np - 50$$

$$4,500 + 50 = 50Np$$

$$4,550 = 50Np$$

$$\frac{4,550}{50} = \frac{50Np}{50}$$

$$Np = 91$$

$$26 \quad 1^{st} \text{ no} = (x + 1)$$

$$2^{nd} \text{ no} = (x + 3)$$

$$3^{rd} \text{ no} = (x + 5)$$

$$3x + 9 = 39$$

$$3x = 39 - 9 \quad 1^{st} \text{ no} = 10 + 1 = 11$$

$$\frac{3x}{3} = \frac{30}{3} \quad 2^{nd} \text{ no} = 10 + 3 = 13$$

$$x = 10 \quad 3^{rd} \text{ no} = 10 + 5 = 15$$

$$27 \quad 111\text{two} = (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0)$$

$$= (1 \times 2 \times 2) + (1 \times 2) + (1 \times 1)$$

$$= 4 + 2 + 1$$

$$= 7\text{ten}$$

$$102\text{three} = (1 \times 3^2) + (0 \times 3^1) + (2 \times 3^0)$$

$$= (1 \times 3 \times 3) + (0 \times 3) + (2 \times 1)$$

$$= 9 + 2$$

$$= 11\text{ten}$$

$$111\text{two} + 102\text{three} = 7\text{ten} + 11\text{ten}$$

$$= 18\text{ten}$$

$$28 \quad 6 \text{ men} = 4 \text{ days}$$

$$1 \text{ man} = (4 \times 6) \text{ days}$$

$$8 \text{ men} = \left(\frac{4 \times 6}{8}\right) \text{ days}$$

$$8 \text{ men} = 3 \text{ days}$$

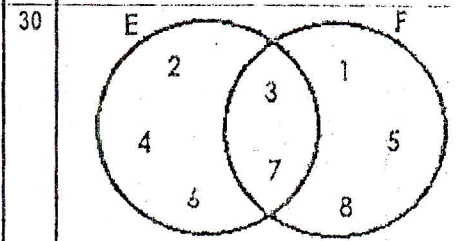
$$29 \quad LCD = 56$$

$$\frac{3}{7} = \frac{3}{7} \times 56 = 24 \dots \dots (ii)$$

$$\frac{5}{14} = \frac{5}{14} \times 56 = 20 \dots \dots (i)$$

$$\frac{13}{28} = \frac{13}{28} \times 56 = 26 \dots \dots (iii)$$

$$= \frac{5}{14}, \frac{3}{7}, \frac{13}{28}$$



$$31 \quad \text{Part (a)}$$

$$LCD = 12 \text{ (Multiply the 3 terms by LCD)}$$

$$12 \left(\frac{2x}{4}\right) - 12 \left(\frac{x+1}{3}\right) = 12(2)$$

$$3(2x) - 4(x+1) = 24$$

$$6x - 4x - 4 = 24$$

$$2x = 24 + 4$$

$$\frac{2x}{2} = \frac{28}{2}$$

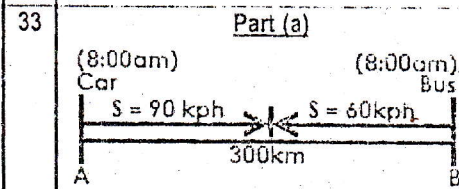
$$x = 14$$

$$32 \quad \text{Part (a)}$$

$$P = \frac{I \times 100}{T \times R}$$

$$= \frac{20,000 \times 100}{2 \times 10}$$

$$= 1,000,000 \text{ Frw}$$



$$\text{Part (b)}$$

$$3x + 40^\circ - 10^\circ = 180^\circ$$

$$3x + 30^\circ = 180^\circ$$

$$3x = 180^\circ - 30^\circ$$

$$\frac{3x}{3} = \frac{150^\circ}{3}$$

$$x = 50^\circ$$

$$x + 40^\circ = 50^\circ + 40^\circ = 90^\circ$$

$$x - 10^\circ = 50^\circ - 10^\circ = 40^\circ$$

$$\text{Part (b)}$$

	1 <sup>st</sup>		2 <sup>nd</sup>		Mix
Qty	8	+	12	=	20
Px/kg	250		x		280

$$(250 \times 8) + (12 \times x) = (280 \times 20)$$

$$2,000F + 12x = 5,600F$$

$$12x = 5,600F - 2,000F$$

$$12x = 3,600F$$

$$\frac{12x}{12} = \frac{3,600F}{12}$$

$$x = 300F$$

The cost/kg of the second type is 300F

Time taken by each to meet another

$$T = \frac{D}{S_1 + S_2}$$

$$= \frac{300\text{km}}{90\text{km/h} + 60\text{km/h}}$$

$$= \frac{300\text{km}}{150\text{km/hr}}$$

$$= 2\text{hr}$$

$$D = S \times T \text{ (Car's information)}$$

$$= (90 \times 2)\text{km}$$

$$= 180\text{km}$$

$$\text{Part (b)}$$

$$T = 8:00\text{am} + 2\text{hr}$$

$$= 10:00\text{am}$$

$$34 \quad \text{Part (a) and part (b)}$$

Teacher's guidance

$$\text{Part (c)}$$

0	1	3	x
0	2	6	3

$$2x = y$$

$$2x = 3$$

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

$$x = 1.5$$

$$35 \quad \text{Frequency table}$$

Ages (x)	Frequency (f)	fx
33	4	132
35	2	70
36	1	36
40	2	80
42	1	42
	Total (f) = 10	Total (fx) = 360

$$\text{Mean} = \frac{\text{Total (f)}}{\text{Total (fx)}} = \frac{360}{10} = 36$$