

# YEAR 2014 WORKING AND ANSWERS

$$\begin{array}{r} 563,091 \\ + 36,909 \\ \hline 600,000 \end{array}$$

$$\begin{aligned} 4 & 0.2\text{hm}^2 = \frac{2}{10} \times 10,000 = 2000\text{m}^2 \\ & 4\text{dam}^2 = 4 \times 100 = 400\text{m}^2 \\ & \text{Therefore, } 2000\text{m}^2 - 400\text{m}^2 = 1600\text{m}^2 \end{aligned}$$

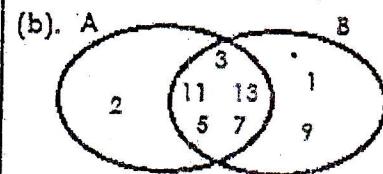
$$\begin{aligned} 7 & 4x + x = 360^\circ - 90^\circ \\ & 5x = 270^\circ \\ & 5x = 270^\circ \\ & \frac{5}{5} = \frac{270^\circ}{5} \\ & x = 54^\circ \end{aligned}$$

- 10 (a).  $x = b$  (corresponding angles)  
 (b).  $a = c$  (alternate angles)

$$\begin{aligned} 13 & 2x - 1 = 2 - x \\ & 2x + x = 2 + 1 \\ & 3x = 3 \\ & 3x = 3 \\ & \frac{3}{3} = \frac{3}{3} \\ & x = 1 \end{aligned}$$

$$\begin{aligned} 16 & = 100\% - 60\% = 40\% \text{ (weigh less)} \\ & \text{Pupils weigh less} = \frac{40}{100} \times 1,200 \\ & = 480 \text{ pupils} \end{aligned}$$

$$19 = \frac{6000}{20} = 300\text{min} = \frac{300}{60} = 5 \text{ hours}$$



$$\begin{aligned} 25 & \text{TSA} = 4\pi r^2 \\ & 5544\text{cm}^2 = \frac{4 \times 22r^2}{7} \\ & 5544\text{cm}^2 \times 7 = 88r^2 \\ & 5544\text{cm}^2 \times 7 = 88r^2 \\ & 88r^2 = 88 \\ & r^2 = 63\text{cm}^2 \times 7 \\ & \sqrt{r^2} = \sqrt{441\text{cm}^2} \\ & r = 21\text{cm} \\ & \text{Vol} = \frac{4}{3}\pi r^3 \\ & = \frac{4}{3} \times \frac{22}{7} \times 21\text{cm} \times 21\text{cm} \\ & \quad \times 21\text{cm} \\ & = 38,808\text{cm}^3 \end{aligned}$$

$$\begin{array}{r} \text{(a). Thousands } (b). 6,000,000 \\ 800,000 \\ + 26 \\ \hline 6,800,026 \end{array}$$

$$\begin{array}{r} 10 \text{ three} = (1 \times 3^1) + (0 \times 3^0) = 3 \text{ten} \\ \begin{array}{|c|c|c|} \hline \text{B} & \text{N} & \text{R} \\ \hline 2 & 3 & (1) \\ \hline 2 & 1 & (1) \\ \hline 0 & & \\ \hline \end{array} \\ = 11 \text{two} \\ 101 \text{two} \\ + 11 \text{two} \\ \hline 1000 \text{two} \end{array}$$

$$\begin{aligned} 8 & = \frac{\text{sum of items}}{\text{number of items}} \\ & = \frac{9 + 3 + 1 + 8 + 4 + 5}{6} = \frac{30}{6} = 5 \end{aligned}$$

$$\begin{array}{l} 11 \quad 4s = 18\text{cm} \\ \quad \quad 4s = 18 \\ \quad \quad \quad 4 = 4 \\ \quad \quad s = 4.5\text{cm} \end{array} \quad \begin{array}{l} \text{A} = S \times S \\ = 4.5\text{cm} \times 4.5\text{cm} \\ = 20.25\text{cm}^2 \end{array}$$

|   |   |    |    |  |
|---|---|----|----|--|
| 3 | 9 | 12 | 15 |  |
|   | 3 | 4  | 5  |  |

HCF = 3 (only 3 can divide all the three numbers at once)

$$\begin{aligned} 17 & \text{(a). 1 book} = (2,400 \div 6)\text{Frw} = 400\text{Frw} \\ & 5,000\text{Frw} = (5,000 \div 400) = 12 \text{ books} \\ & \text{(b). Bal} = 5,000\text{Frw} - (400 \times 12)\text{Frw} \\ & = 5,000\text{Frw} - 4,800\text{Frw} \\ & = 200\text{Frw} \end{aligned}$$

$$20 = \frac{3}{5} \times \frac{5}{4} \times \frac{4}{9} = \frac{1}{3}$$

$$21 = \frac{4 \times m \times p + 3 \times n}{n}$$

$$= \frac{4 \times 3 \times 2 + 3 \times 6}{6}$$

$$= \frac{24 + 18}{6} = \frac{42}{6} = 7$$

$$22 \quad \text{Teacher's guidance}$$

$$24 \quad P = SP - CP$$

$$= 66,000\text{Frw} - 55,000\text{Frw}$$

$$= 11,000\text{Frw}$$

$$\%P = \frac{P}{CP} \times 100$$

$$= \frac{11,000}{55,000} \times 100$$

$$= 20\%$$

$$26 \quad \text{(a). Angle ABC} = \text{Angle ACB} = 45^\circ$$

$$\text{Angle CAD} = 180^\circ - (\text{CDA} + \text{ACD})$$

$$= 180^\circ - (90^\circ + 45^\circ)$$

$$= 180^\circ - 135^\circ$$

$$= 45^\circ$$

(b). Triangle ABC is an Isosceles triangle

$$27 \quad LCD = 300$$

$$0.42 = \frac{42}{100} \times 300 = 126 \dots \text{(iii)}$$

$$\frac{11}{25} = \frac{11}{25} \times 300 = 132 \dots \text{(iv)}$$

$$\frac{12}{30} = \frac{12}{30} \times 300 = 120 \dots \text{(i)}$$

$$0.41 = \frac{41}{100} \times 300 = 123 \dots \text{(ii)}$$

$$= \frac{12}{30}, 0.41, 0.42, \frac{11}{25}$$

$$60 + 30 = 90$$

$$90 - 45 = 45$$

$$\text{Hours}$$

$$2 - 1 = 1$$

$$1 - 1 = 0$$

$$\text{Minutes}$$

$$90 \div 60 = 1.5$$

$$1.5 \times 60 = 90$$

$$90 \div 45 = 2$$

$$2 \times 60 = 120$$

$$120 \div 90 = 1.33$$

$$1.33 \times 60 = 80$$

$$80 \div 45 = 1.78$$

$$1.78 \times 60 = 107$$

$$107 \div 90 = 1.19$$

$$1.19 \times 60 = 71$$

$$71 \div 45 = 1.58$$

$$1.58 \times 60 = 94$$

$$94 \div 90 = 1.04$$

$$1.04 \times 60 = 62$$

$$62 \div 45 = 1.37$$

$$1.37 \times 60 = 82$$

$$82 \div 90 = 0.91$$

$$0.91 \times 60 = 55$$

$$55 \div 45 = 1.22$$

$$1.22 \times 60 = 73$$

$$73 \div 90 = 0.81$$

$$0.81 \times 60 = 49$$

$$49 \div 45 = 1.08$$

$$1.08 \times 60 = 65$$

$$65 \div 90 = 0.72$$

$$0.72 \times 60 = 43$$

$$43 \div 45 = 0.95$$

$$0.95 \times 60 = 57$$

$$57 \div 90 = 0.63$$

$$0.63 \times 60 = 38$$

$$38 \div 45 = 0.84$$

$$0.84 \times 60 = 50$$

$$50 \div 90 = 0.56$$

$$0.56 \times 60 = 34$$

$$34 \div 45 = 0.75$$

$$0.75 \times 60 = 45$$

$$45 \div 90 = 0.5$$

$$0.5 \times 60 = 30$$

$$30 \div 45 = 0.67$$

$$0.67 \times 60 = 40$$

$$40 \div 90 = 0.44$$

$$0.44 \times 60 = 26$$

$$26 \div 45 = 0.58$$

$$0.58 \times 60 = 34$$

$$34 \div 90 = 0.38$$

$$0.38 \times 60 = 23$$

$$23 \div 45 = 0.51$$

$$0.51 \times 60 = 30$$

$$30 \div 90 = 0.33$$

$$0.33 \times 60 = 20$$

$$20 \div 45 = 0.44$$

$$0.44 \times 60 = 26$$

$$26 \div 90 = 0.29$$

$$0.29 \times 60 = 17$$

$$17 \div 45 = 0.38$$

$$0.38 \times 60 = 23$$

$$23 \div 90 = 0.26$$

$$0.26 \times 60 = 15$$

$$15 \div 45 = 0.33$$

$$0.33 \times 60 = 20$$

$$20 \div 90 = 0.22$$

$$0.22 \times 60 = 13$$

$$13 \div 45 = 0.29$$

$$0.29 \times 60 = 17$$

$$17 \div 90 = 0.19$$

$$0.19 \times 60 = 11$$

$$11 \div 45 = 0.24$$

$$0.24 \times 60 = 14$$

$$14 \div 90 = 0.16$$

$$0.16 \times 60 = 9$$

$$9 \div 45 = 0.2$$

$$0.2 \times 60 = 12$$

$$12 \div 90 = 0.13$$

$$0.13 \times 60 = 8$$

$$8 \div 45 = 0.18$$

$$0.18 \times 60 = 10$$

$$10 \div 90 = 0.11$$

$$0.11 \times 60 = 6$$

$$6 \div 45 = 0.13$$

$$0.13 \times 60 = 8$$

$$8 \div 90 = 0.09$$

$$0.09 \times 60 = 5$$

$$5 \div 45 = 0.11$$

$$0.11 \times 60 = 6$$

$$6 \div 90 = 0.07$$

$$0.07 \times 60 = 4$$

$$4 \div 45 = 0.09$$

$$0.09 \times 60 = 5$$

$$5 \div 90 = 0.06$$

$$0.06 \times 60 = 3$$

$$3 \div 45 = 0.07$$

$$0.07 \times 60 = 4$$

$$4 \div 90 = 0.05$$

$$0.05 \times 60 = 3$$

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$$3 \div 45 = 0.07$$

$$0.07 \times 60 = 4$$

$$4 \div 90 = 0.05$$

$$0.05 \times 60 = 3$$

28 (a). Actual Length =  $(10 \times 6)m$  = 60m  
 (b). Actual width =  $(10 \times 5)m$  = 50m  
 (c). Surface area =  $L \times W$   
 $= 60m \times 50m$   
 $= 3,000m^2$

29  $P = \frac{I \times 100}{T \times R}$   
 $= \frac{20,000 \times 100}{2 \times 10}$   
 $= 100,000 \text{ Frw}$

|           |                  |
|-----------|------------------|
| A = P + I | 1 0 0, 0 0 0 Frw |
|           | + 2 0, 0 0 0 Frw |
|           | 1 2 0, 0 0 0 Frw |

30  $A = \frac{h}{2} (a + b)$   
 $= \frac{4\text{cm}}{2} (14\text{cm} + 6\text{cm})$   
 $= 2\text{cm} \times 20\text{cm}$   
 $= 40\text{cm}^2$

31 Part (a)

$$\begin{aligned} &= 2a^2b - ac \\ &= 2 \times a \times a \times b - a \times c \\ &= 2 \times 1 \times 1 \times 2 - 1 \times 3 \\ &= 4 + 3 \\ &= 7 \end{aligned}$$

Part (b)

- (i). Rectangle  
 (ii). Length = Length

$$3x + 1 = x + 9$$

$$3x - x = 9 - 1$$

$$2x = 8$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

$$L = (4 + 9)\text{cm} = 13\text{cm}$$

$$W = (3 \times 4 - 7)\text{cm} = (12 - 7)\text{cm} = 5\text{cm}$$

(iii). Perimeter and surface area

$$\begin{aligned} P &= 2(L + W) & A &= L \times W \\ &= 2(13\text{cm} + 5\text{cm}) & &= 13\text{cm} \times 5\text{cm} \\ &= 2 \times 18\text{cm} & &= 65\text{cm}^2 \\ &= 36\text{cm} & & \end{aligned}$$

32 Part (a)

Interest for 1<sup>st</sup> year

$$\begin{aligned} &= \frac{P \times T \times R}{100} \\ &= \frac{3,000,000 \times 1 \times 5}{100} \\ &= 150,000 \text{ Frw} \end{aligned}$$

$$A = P + I$$

$$\begin{aligned} &= 3,000,000 \text{ Frw} + 150,000 \text{ Frw} \\ &= 3,150,000 \text{ Frw} \end{aligned}$$

Interest for 2<sup>nd</sup> year

$$\begin{aligned} &= \frac{P \times T \times R}{100} \\ &= \frac{3,150,000 \times 1 \times 5}{100} \\ &= 157,500 \text{ Frw} \end{aligned}$$

C.I = Total interest of (1<sup>st</sup> yr + 2<sup>nd</sup> yr)

$$\begin{aligned} &= 150,000 \text{ Frw} + 157,500 \text{ Frw} \\ &= 307,500 \text{ Frw.} \end{aligned}$$

Part (b)

$$A = P + C.I$$

$$\begin{aligned} &= 3,000,000 \text{ Frw} + 307,500 \text{ Frw} \\ &= 3,307,500 \text{ Frw.} \end{aligned}$$

33 Part (a)

$$C = 2\pi r$$

$$44 = \frac{2 \times 22r}{7}$$

$$44 \times 7 = 44r$$

$$\frac{44 \times 7}{44} = \frac{44r}{44}$$

$$r = 7\text{cm}$$

$$V = \pi r^2 h$$

$$\begin{aligned} &= \frac{22 \times 7\text{cm} \times 7\text{cm} \times 10\text{cm}}{7} \\ &= 1,540\text{cm}^3 \end{aligned}$$

Part (b)

$$TSA = 2\pi r^2 + 2\pi r h$$

$$= \frac{2 \times 22 \times 7 \times 7}{7} + \frac{2 \times 22 \times 7 \times 10}{7}$$

$$= 308\text{cm}^2 + 440\text{cm}^2$$

$$= 748\text{cm}^2$$

34 Part (a)

$$\begin{aligned} Vol &= \frac{b \times h}{2} \times L \\ &= \frac{12\text{cm} \times 5\text{cm}}{2} \times 25\text{cm} \\ &= 30\text{cm}^2 \times 25\text{cm} \\ &= 750\text{cm}^3 \end{aligned}$$

Part (b)

$$\begin{aligned} \text{Hypotenuse (H)} &= \sqrt{b^2 + h^2} \\ &= \sqrt{(5 \times 5) + (12 \times 12)} \\ &= \sqrt{25\text{cm}^2 + 144\text{cm}^2} \\ &= \sqrt{169\text{cm}^2} \\ &= 13\text{cm} \end{aligned}$$

$$\begin{aligned} TSA &= (b \times h) + L(b + h + H) \\ &= (12 \times 5)\text{cm}^2 + 25(5 + 12 + 13)\text{cm}^2 \\ &= 60\text{cm}^2 + (25 \times 30)\text{cm}^2 \\ &= 60\text{cm}^2 + 750\text{cm}^2 \\ &= 810\text{cm}^2 \end{aligned}$$

35 Part (a)

| Marks, $x$ | Frequency, $f$  | $fx$              |
|------------|-----------------|-------------------|
| 8          | 4               | 32                |
| 10         | 6               | 60                |
| 11         | 3               | 33                |
| 12         | 4               | 48                |
| 15         | 1               | 15                |
| 16         | 2               | 32                |
|            | Total, $f = 20$ | Total, $fx = 220$ |

Part (b)

Mode mark = 10

Part (c)

$$\text{Mean} = \frac{\text{Total } fx}{\text{Total } f} = \frac{220}{20} = 11$$