K.C.S.E YEAR 2010 PAPER 1 MARKING

1. $=\frac{-2(5+3)-9\div3+5}{-3\times-5+(-2)\times4}=\frac{-14}{7}$

$=-2$

2. Total fraction:

$\frac{3}{8}+\frac{2}{5}=\frac{31}{40}$

Remaining fraction $=1-\frac{31}{40}$

$=\frac{9}{40}$

$original\ amount = sh.12330\times\frac{40}{9}$

=sh.54800

$Tatu's\ fees = sh\frac{2}{5}\times54800$

=sh.21920

3. Gradient (perpendicular) $=-\frac{1}{2}$

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

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

4. let the distance be d km

$\frac{d}{75}\ and\ \frac{d}{95}$

$\therefore\frac{d}{75}-\frac{d}{95}=\frac{20}{60}$

d = 118.75km

5. Let odd integers be:

x, (x + 2), (x + 2 + 2)

x + (x + 2) + (x + 2 + 2) > 219

3x >.213

X = 71

The numbers are 73, 75, 77

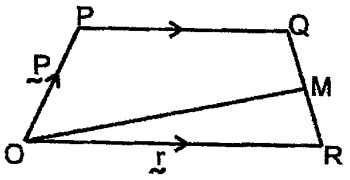
6. (a) sh.77.24 x 100,000

=sh.7,724,000

(b) $\frac{sh.77.24\times10000}{122.27}$

=£63172

7



$RQ=-r+p+\frac{1}{3}r$

$=P-\frac{2}{3}r$

$OM=r+\frac{1}{2}(P-\frac{2}{3}r)$

$=\frac{2}{3}r+\frac{1}{2}p$

8.

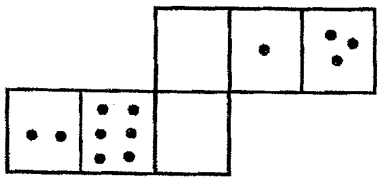
$27^{\frac{2}{3}}\times\left(\frac{81}{16}\right)^{-\frac{1}{4}}=\left(3^3\right)^{\frac{2}{3}}\times\left(\frac{3^4}{2^4}\right)^{-\frac{1}{4}}$

$=3^2\times\left(\frac{3}{2}\right)^{-1}$

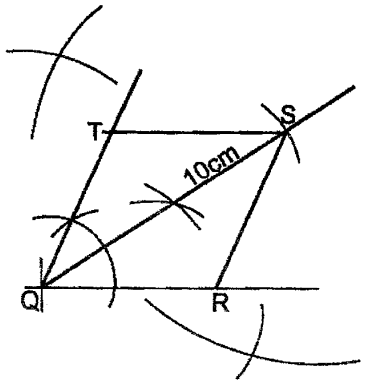
$=3^2\times\frac{2}{3}$

$=6$

9.



10.



< TQR = 60°; QS= 10cm and bisects <TQR

Mediator (⊥ or bisector) of QS drawn or

<RSQ =<QST=<RQS=30°

✓ Rhombus completed

11. No of oranges for Friday
1948 – (750 + 750 + 240)
=208
No of oranges for Saturday
208 + 560 = 768
∴ Amount = sh.8 × 768
=sh.6144

12. $\frac{x^2+x-4xy-4y}{(x+1)(4y^2-xy)} = \frac{x(x+1)-4y(x+1)}{(x+1)(y)(4y-x)}$

$= \frac{(x-4y)(x+1)}{(x+1)(-y)(x-4y)}$

$= -\frac{1}{y}$

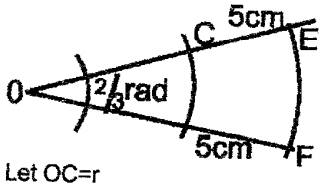
13. Sin 3θ = cos 2 θ
∴ sin 3θ = sin (90° - 2θ)
∴ 3θ=90° - 2θ
5 θ = 90
θ = 18°

14. $2\pi r^2 + 2\pi rh = 154$
r = h
$2\pi r^2 + 2\pi r^2 = 154$
$4\pi r^2 = 154$

$r = \sqrt{\frac{154}{4 \times 3.142}}$

r =3.500
∴ diameter = 2r = 3.500 × 2
=7.00(2dp)

15.



Let OC=r

$\therefore CD = \frac{2}{3}r \text{ and } EF = \frac{2}{3}(r+5)$

$\frac{2}{3}r + \frac{2}{3}(r+5) + 5 + 5 = 24$

$\frac{4}{3}r = 10\frac{2}{3}$

r=8

16.
Total number of seedlings
(5×1)+(10×3) + (15×1)+(20×4)+(30×1)+(10×2)
=5+30+15+80+30+20 = 180
% of height (h) : 23 ≤ h < 27

$= \left(\frac{30+15}{180}\right) \times 100$

=25%

17. (a) Total sales = sh.360 ×500
= sh.180,000
Commission = sh(180,000 – 100,000)×$^2/_3$
=sh.1600
Total earnings = sh.(12,000 + 1600)
=13600

(b) (i) New salary = sh.(12000 + 12000×$^{10}/_{100}$)
=sh. 13200
Commission paid = sh(17,600 – 13,200
=sh.4400
Commission is paid on sh.4400 × $^{100}/_2$
= 220,000
Total sales = sh.220,000 + 100,000
=320,000/=

(ii) $No\ of\ handbags\ sold = \frac{320,000}{500}$
=640

18. (a) (i) Internal volume of box=150×80×40cm^3
=480,000cm^3
External volume of bos = 152×82×42cm^3
=523488cm^3
∴ Volume of wood =(523488 – 480,000)cm^3
=43488cm^3

(ii) $Mass\ of\ box = \frac{43488 \times 0.6}{1000}$
=26092.8
=26.1kg

(b) (i) $No\ of\ tins = \frac{150}{10} \times \frac{80}{10} \times \frac{40}{10}$
=240

(ii) $Total\ mass = 26.1 + \left(\frac{240 \times 120}{1000}\right)$
=54.9kg

19. (a) Det I 45 – 42 I = 3

Inverse $A^{-1} = \frac{1}{3}\begin{pmatrix} 9 & -6 \\ -7 & 5 \end{pmatrix}$

(b)
$\begin{pmatrix} 5 & 6 \\ 6 & 9 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2440 \\ 3560 \end{pmatrix}$

(ii)

$\frac{1}{3}\begin{pmatrix} 9 & -6 \\ -7 & 5 \end{pmatrix}\begin{pmatrix} 5 & 6 \\ 6 & 9 \end{pmatrix}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 3 & -2 \\ \frac{-7}{3} & \frac{5}{3} \end{pmatrix}\begin{pmatrix} 2440 \\ 3560 \end{pmatrix}$

$$\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}3\times2440-2\times3560\\ \frac{-7}{3}\times2440+\frac{5}{3}\times3560\end{pmatrix}$$

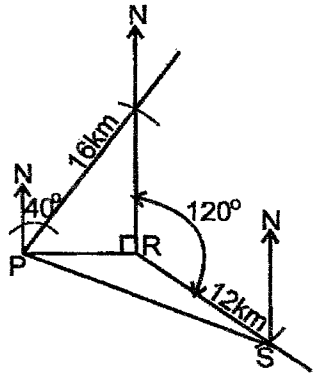
$$\begin{pmatrix}x\\ y\end{pmatrix}=\begin{pmatrix}200\\ 240\end{pmatrix}$$

$\therefore x=200 \;;\; y=240$

(c) Total cost of books $=(36\times200)+(50\times240)$
$=19200$

Total cost with discount
$\frac{36\times200\times95}{100}+\frac{50\times240\times92}{100}$
$=17880$
% discount
$=\frac{19200-17880}{19200}\times100$
$=6.875\%$

20. Given scale: 1cm to 2 km



(b) (i) Distance of P from S $= 10.8 \pm 0.1$cm
$=21.6$km

(ii) $<PSN = 74 \pm 1°$
Bearing of P from S $= 286 \pm 1°$

(c) Area of Δ PQR $= \frac{1}{2}\times 10.2 \times 12.2$
$= 62.22\text{km}^2$

Area of Δ PRS $= \frac{1}{2}\times10.2\times12 \sin 150°$
$=30.6\text{km}^2$
Area of ranch PQRS
$=62.22 + 30.6$
$=92.82\text{km}^2$

21. (a) (i) *A takes* $\frac{180}{x+10}$

(ii) *B takes* $\frac{180}{x}$

(b) $\frac{180}{x}-\frac{180}{x+10}=\frac{3}{2}$

$180(x+10)-180x=\frac{3}{2}x(x+10)$

$360x+3600-360x=3x^2+30x$

$X^2+10x-1200=0$
$(x-30)(x+40)=0$
$X=30$ or $x=-40$
Speed of A $=30+10=40$

(c) Time taken by A $=\frac{48}{40}\times60=72$min

Time taken by B $=\frac{48}{30}\times60=96$min

Time for B $=96-10=86$ min
$86-72=14$min

22. (a) (i) Reflection in the line PR or ER
0r PER

(ii) Enlargement centre E
Scale factor – 1

(iii) Rotation about pt R
Through 90°
Clockwise

(c) R ⟶ S
C ⟶ A

(ii) R ⟶ Q
C ⟶ E

23. Modal frequency = 8
(b)

No of kg of meat	Fre. (f)	Mid pts (x)	fx	cf
1 - 5	2	3	6	2
6 – 10	3	8	24	5
11 – 15	6	13	78	11
16 - 20	8	18	144	19
21 – 25	3	23	69	22
26 – 30	2	28	56	24
31 – 35	1	33	33	25
	$\Sigma f=25$		$\Sigma fx=410$	

Mean $=\frac{410}{25}=16.4$

(d) 2, 5, 11, 19, 22, 24,25
Median $=15.5+\frac{12.5-11}{8}\times5$
$=15.5+\frac{1.5}{8}\times5$
$=16.4375$

24. (a) (i) Area of base x^2

Or Area of sides = 4xh

$X^2 + 4xh = 432$

$$h = \frac{432 - x^2}{4x}$$

(iii) Volume = x^2h

$= x^2(432 - x^2)$

(b) (i) Volume (v) = $108x - \frac{1}{4}x^3$

$$\frac{dv}{dx} = 108 - \frac{3}{4}x^2$$

$$108 - \frac{3}{4}x^2 = 0$$

x=12

(ii) Vol = $108x - \frac{1}{4}x^3$

$= (108 \times 2) - \frac{1}{4} \times 12^3$

$= 864cm^3$