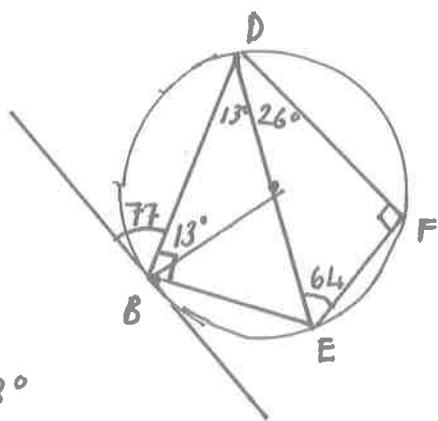


2015 National 5 Paper 1.

1.  $6\frac{1}{3} - 2\frac{1}{3}$   
 $= \frac{1}{3} - \frac{1}{3}$   $6-2=4$   
 $= \frac{3}{15} - \frac{5}{15}$   
 $= -\frac{2}{15}$   
 $\Rightarrow 4 - \frac{2}{15}$   
 $= \underline{\underline{3\frac{13}{15}}}$

2.  $11 - 2(1 + 3x) < 39$   
 $-2 - 6x < 28$   
 $-6x < 30$   
 $-x < 5$   
 $x > -5$

3.  
 $180 - (90 + 64)$   
 $= 180 - 154$   
 $= 180 - 26154$   
 $= \underline{\underline{26^\circ}}$



$\angle BDF = 26^\circ + 13^\circ$   
 $= \underline{\underline{39^\circ}}$

4.  $(x-4)(x^2+x-2)$   
 $= x^3 + x^2 - 2x - 4x^2 - 4x + 8$   
 $= x^3 - 3x^2 - 6x + 8$

5.  $\bar{x} = \frac{15}{5} = 3$   $s = \sqrt{\frac{32}{4}}$

| $x$ | $x - \bar{x}$ | $(x - \bar{x})^2$ | $s = \sqrt{8}$                           |
|-----|---------------|-------------------|--|
| 1   | -2            | 4                 | $\therefore \underline{\underline{a=8}}$ |
| 2   | -1            | 1                 |  |
| 2   | -1            | 1                 |  |
| 2   | -1            | 1                 |  |
| 8   | 5             | 25                |  |

6.  $y = a \sin bx$

• min/max is  $-4/4$   
 $\therefore \underline{a=4}$

• Graph occurs 3 times in  $360^\circ$   
 $\therefore \underline{b=3}$

7.  $(x+a)^2 + b$

$a = -2, b = -4$

axis of symmetry  $x = -2$

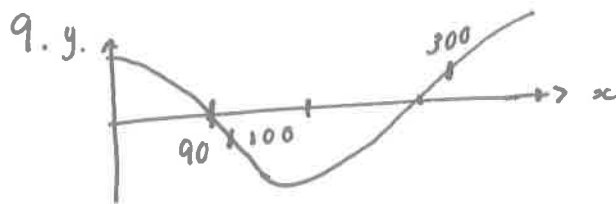
8.  $m_{AB} = \frac{y_A - y_B}{x_A - x_B}$   $A(-2, 5)$   
 $B(3, 15)$   
 $= \frac{5 - 15}{-2 - 3}$   
 $= \frac{-10}{-5}$   
 $= \underline{\underline{2}}$

$y - b = m(x - a)$  at  $(-2, 5)$

$y - 5 = 2(x + 2)$

$y - 5 = 2x + 4$

$y = \underline{\underline{2x + 9}}$



From graph:  $\cos 90 = 0$   
 $\cos 100 = \text{negative}$   
 $\cos 300 = \text{positive}$

$\therefore \underline{\underline{\cos 100^\circ, \cos 90^\circ, \cos 300^\circ}}$



## 2015 National 5 Paper 2

$$1. 240\,000 \times 1.028^2$$

$$= \underline{\underline{\pounds 253\,628.16}}$$

$$2. f(x) = 3x + 2$$

$$f(a) = 3a + 2 = 23$$

$$3a = 21$$

$$\underline{\underline{a = 7}}$$

$$3. C^2 = a^2 + b^2 - 2ab \cos c$$

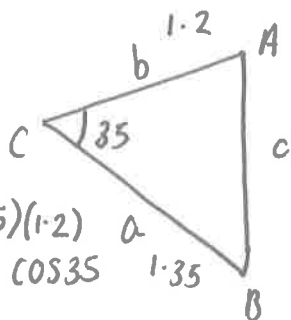
$$= (1.2)^2 + (1.35)^2 - 2(1.35)(1.2)$$

$$= 0.608 \dots$$

$$C = \sqrt{0.608 \dots}$$

$$= 0.779 \dots$$

$$= \underline{\underline{0.8 \text{ km}}}$$



$$4. |u| = \sqrt{6^2 + (-13)^2 + (18)^2}$$

$$= \underline{\underline{23}}$$

$$5. \underline{p} = \begin{pmatrix} -5 \\ 3 \end{pmatrix} \quad \underline{q} = \begin{pmatrix} 4 \\ -5 \end{pmatrix}$$

$$\underline{p} + \underline{q} = \begin{pmatrix} -5 \\ 3 \end{pmatrix} + \begin{pmatrix} 4 \\ -5 \end{pmatrix}$$

$$= \underline{\underline{\begin{pmatrix} -1 \\ -2 \end{pmatrix}}}$$

$$6a) V = \frac{4}{3} \pi (6400)^3$$

$$= \underline{\underline{1.1 \times 10^{12} \text{ km}^3}}$$

$$b) = 1.1 \times 10^{12} \div 2.2 \times 10^{10}$$

$$= \underline{\underline{50}}$$

$$7. \frac{5t}{s} \div \frac{t}{28^2}$$

$$= \frac{5t}{s} \times \frac{28^2}{t}$$

$$= \frac{10s^2t}{st}$$

$$= \underline{\underline{10s}}$$

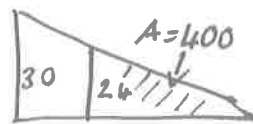
$$8. 85\% = 297.50$$

$$1\% = 297.50 \div 85$$

$$= 3.50$$

$$\underline{\underline{100\% = \pounds 350}}$$

$$9. SF = \frac{30}{24} = \frac{5}{4}$$



$$SF(\text{Area}) = \left(\frac{5}{4}\right)^2 \times 400$$

$$= 625 \text{ cm}^3$$

$$A_{\text{pats}} = 625 - 400$$

$$= \underline{\underline{225 \text{ cm}^3}}$$

$$10. \text{Arc length} = \frac{x}{360} \times \pi \times 2r$$

$$28.4 = \frac{65}{360} \times \pi \times 2r$$

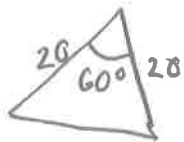
$$360 \times 28.4 = 65 \times \pi \times 2r$$

$$r = \frac{360 \times 28.4}{65 \times \pi \times 2}$$

$$r = 25.033 \dots$$

$$\underline{\underline{r = 25.0 \text{ cm}}}$$

11.  $A = \frac{1}{2} ab \sin C$



$= \frac{1}{2} (20)(20) \sin 60$

$= 173.205...$

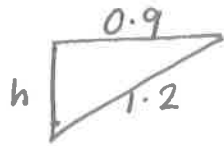
$= \underline{173.2 \text{ cm}^2}$

$A_{\text{table}} = 173.2 \times 6$

$= \underline{\underline{1039.2 \text{ cm}^2}}$

12. depth = radius + height

$h^2 = 1.2^2 - 0.9^2$



$h = \sqrt{1.2^2 - 0.9^2}$

$= 0.793...$

$= \underline{0.8 \text{ m}}$

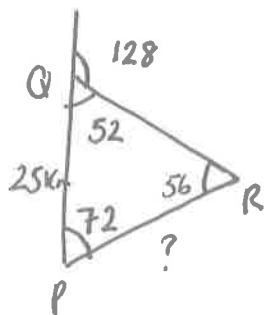
height =  $1.2 + 0.8$

(depth) = 2m

13.

$\frac{q}{\sin Q} = \frac{r}{\sin R}$

$\frac{q}{\sin 52} = \frac{25}{\sin 56}$



$q = 23.762$

$q = \underline{\underline{23.8 \text{ km}}}$

14a) length =  $2x + 13$

b) width =  $2x + 9$

$A = (2x + 13)(2x + 9)$

$270 = 4x^2 + 18x + 76x + 117$

$0 = 4x^2 + 44x - 153$

c)  $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = 4$

$b = 44$

$c = -153$

$x = \frac{-44 \pm \sqrt{1936 + 2448}}{8}$

$x = \frac{-44 + \sqrt{4364}}{8}$

$x = \frac{-44 - \sqrt{4364}}{8}$

$x = 2.757...$

$x = -13.757...$

$x = \underline{\underline{2.8}}$

$x = \underline{\underline{-13.8}}$

2.8