## 8.3 Mathematics Alt.B Paper 1 (122/1)

1. $\frac{-3\times {}^{+}6+{}^{-}2}{-4+{}^{+}5-{}^{-}3}=\frac{-18+{}^{-}2}{1+3}=-5$

*(3marks)*

2. $1890=2\times3\times3\times3\times5\times7$
   $1008=2\times2\times2\times2\times3\times3\times7$
   Common prime factors
   3, 5, 7

*(2marks)*

3. 0850h + 6h 30min = 1520h
   1520h + 1h 45min = 1705h
   1705h + 3h 15min = 2020h
   2020h + 35min = 2055h
   Time of arrival in 12h system
   2055 – 12 = 8.55pm

*(3marks)*

4. $(4.321\times10^{-1})^3=80.68\times10^{-3}$
   $=0.08068$

*(3marks)*

5. $\pi r^2\times45=25000$
   $r=\sqrt{\frac{25000}{\pi\times45}}$
   $=13.29807601$
   $=13.3$

*(3marks)*

6. $3x\leq2x+3$
   $x\leq3$
   $2x+3<4x+5$
   $-x<1$
   $x>-1$
   Integral values: 0, 1, 2, 3.

*(3marks)*

7. $234=2\times3^2\times13$
   $270=2\times3^2\times5$
   $324=2^2\times3^4$
   $\therefore$ HCF of 234,270 & $324=2\times3^2=18$
   Number of pieces
   $\frac{234}{18}+\frac{270}{18}+\frac{324}{18}=46$

*(4marks)*

8.

$$\frac{\frac{6}{5}-\frac{3}{8}\times\frac{3}{2}}{\frac{6}{7}\times\frac{3}{2}-\frac{3}{8}}=\frac{\frac{6}{5}-\frac{9}{16}}{\frac{9}{7}-\frac{3}{8}}$$

$$=\frac{\frac{51}{80}}{\frac{51}{56}}$$

$$=\frac{7}{10}$$

***(3marks)***

9. $h^2 = 6.5^2 - 2.5^2$

$h = \sqrt{6.5^2 - 2.5^2}$

$= \sqrt{36}$

$= 6$

Height of pole

$= 6 + 0.9$

$= 6.9\text{m}$

***(3marks)***

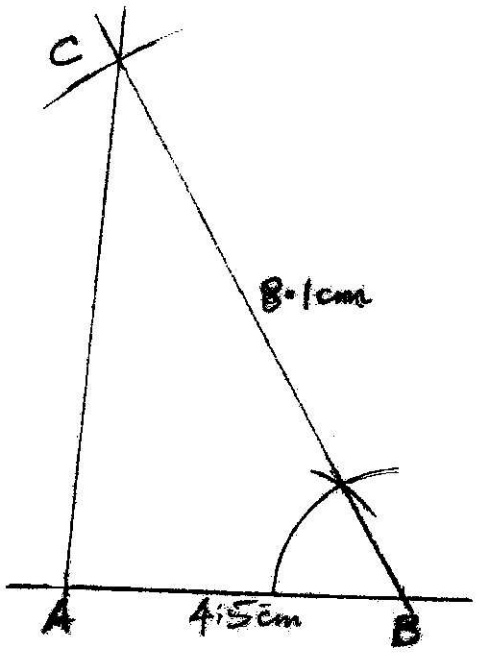
10.

| No. | Log |
|---|---|
| 2.5 | 0.3979 |
| 0.064 | $\bar{2}.8062$ |
| 8.1 | $\bar{1}..2041$ |
| | - |
| | 0.9085 |
| | $\bar{2}.2956 \times \frac{1}{2}$ |
| 0.1405 | $\bar{1}.1478$ |

$= 0.1405$

***(3marks)***

11.




$\angle CBA = 86 \pm 1^{o}$

*(3marks)*

12. Linear scale factor $= \sqrt{\frac{16}{25}} = \frac{4}{5}$

Volume scale factor$= \left(\frac{4}{5}\right)^3$

$\therefore$ Volume of smaller cylinder $= \frac{64}{125} \times 800 = 409.6 \text{ cm}^3$

*(4marks)*

13. $x^2 + 8x - 384 = 0$
$(x + 24)(x - 16) = 0$
$x = -24$ or $x = 16$

*(3marks)*

14. Sum of angles of regular polygon
$(2n - 4)\ 90 = 1620$
$2n - 4 = 18$
$n = 11$

*(2marks)*

15. $p = 3 + q$
$(3+q)^2 - q^2 = 21$
$9 + 6q + q^2 - q^2 = 21$
$q = 2$
$p = 5$

*(4marks)*

16. Area of sector $= \frac{120^0}{360^0} \times 3^2 \times \pi$

$= 9.42$

Area of rhombus $= \frac{1}{2} \times 3^2 \times 2 \times \text{Sin } 120$

$= 7.79$

Area of shaded region $= 9.42 - 7.79$

$= 1.63$

***(4marks)***

17. (a) $800000 - 500000 = 300000$

$48000 + \frac{3}{100} \times 300000 = 57000$

(b) $780000 - 48000 = 30000$

$30000 \times \frac{100}{3} + 500000 = 1500000$

(c) $\frac{40}{100} \times \frac{3}{100} \times (2500000 - 500000) = 24000$

$24000 + 48000 = 72000$

***(10marks)***

18. (a) (i) $\frac{y-5}{x-0} = 2$

$y = 2x + 5$

(ii) Gradient of $L_2$

$m_1 \times m_2 = -1$

$2 \times m_2 = -1$

$m_2 = -\frac{1}{2}$

Equation of $L_2$

$\frac{y}{x+2.5} = -\frac{1}{2}$

$y = -\frac{1}{2}x - \frac{5}{4}$

(iii) Equation of $L_3$

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

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

b) At intersection of $L_1$ and $L_3$

$$2x+5=-\frac{1}{2}x+2\frac{1}{2}$$

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

$$x=-1$$

$$y=2(-1)+5=3$$

Coordinates of point of intersection = (-1,3)

***(10marks)***

19. a) Nehema's faction:

$$1-\left(\frac{1}{3}+\frac{2}{5}\right)=1-\frac{11}{15}=\frac{4}{5}$$

Amount Nehema got

$$\frac{4}{5}\times 750000=200000$$

b) Profit realized after taxation:

Before taxation

$$\frac{36}{100}\times 750000=270000$$

After taxation

$$\frac{95}{100}\times\ 270000=256500$$

c) Amount to be shared after each received 20000

$= 256500 - 60000$

$= 196500$

Ratio of sharing

Amani: Furaha: Nehema $= \frac{1}{3}:\frac{2}{5}:\frac{4}{15}$

$= 5:6:4$

Furaha's share more than Nehema's

$$196500\left(\frac{6-4}{15}\right)=26\ 200$$

***(10marks)***