

1. Find the sum of the first 28 terms in

$$3 + 10 + 17 + \dots$$

$$\frac{n}{2} \{ 2a + (n-1)d \}$$

$$\frac{28}{2} \{ 6 + 27 \times 7 \}$$

$$14(6 + 189)$$

$$14 \times 195$$

$$= \underline{\underline{2730}}$$

(3mks)

2. Find the magnitude of the displacement vector of the origin (0,0,0) when moved to (8,1,1).

$$\begin{pmatrix} 8 & 0 \\ 1 & 0 \\ 0 & 0 \end{pmatrix} = \begin{pmatrix} 8 \\ 1 \\ 1 \end{pmatrix}$$

(3mks)

$$\frac{\sqrt{64+1+1}}{\sqrt{66}} = \underline{\underline{8.06}}$$

3. Points A(2,4), B(3,7) and C(5,13) are three points on the cartesian plane. Determine whether the three points are collinear.

$$AB \Rightarrow$$

$$\begin{pmatrix} 3-2 \\ 7-4 \end{pmatrix}$$

$$AB \begin{pmatrix} 1 \\ 3 \end{pmatrix}$$

$$BC \begin{pmatrix} 5-3 \\ 13-7 \end{pmatrix}$$

$$BC \begin{pmatrix} 2 \\ 6 \end{pmatrix}$$

$$AB \begin{pmatrix} 1 \\ 3 \end{pmatrix}$$

$$BC \begin{pmatrix} 2 \\ 6 \end{pmatrix}$$

$$\underline{\underline{2AB = BC}} \quad (3mks)$$

4. Write down the expansion of  $(x-y)^4$ .

$$(x-y)$$

(3mks)

$$(x-y)^4 \Rightarrow x^4 - 4x^3y + 6x^2y^2 - 4xy^3 + y^4$$

$$\underline{x^4 - 4x^3y + 6x^2y^2 - 4xy^3 + y^4}$$

5. If  $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ , find  $f$  given that  $u = 0.5$  and

$$v = 0.8$$

$$\frac{1}{f} = \frac{1}{0.5} + \frac{1}{0.8}$$

$$\frac{1}{10f} = \frac{1}{5} + \frac{1}{8} \quad \frac{80+50}{40}$$

$$\frac{1}{10f} = \frac{130}{40}$$

$$\frac{1}{10} = \frac{13}{40} f$$

$$f = \frac{40}{130}$$

$$f = \frac{4}{13}$$

$$f = \underline{\underline{0.308}}$$

(3 marks)

6. Simplify  $x^2y^2 \times x^2y^5 \times x^{-3}y^{-9}$

$$x^{2+2-3} y^{2+5-9}$$

$$\underline{\underline{xy}}$$

(3 marks)

7. Use logarithm tables to evaluate

$$\frac{94.7 \times 16.45}{12.5 \times 8.93}$$

No	S.f	Log
94.7	$9.47 \times 10^1$	1.9763
16.45	$1.645 \times 10^1$	1.2162
		<u>3.1925</u>
12.5	$1.25 \times 10^1$	1.0969
8.93	$8.93 \times 10^0$	0.9509
		<u>2.0478</u>

$$\begin{array}{r} 3.1925 \\ - 2.0478 \\ \hline 1.1447 \\ 10 \times 1.395 \\ \hline = \underline{\underline{13.95}} \end{array}$$

(4 marks)

8. state the gradient and y-intercept in

$$(i) 3y - 4x = 5$$

$$3y = 5 + 4x$$

$$y = \frac{4}{3}x + \frac{5}{3}$$

$$G = \frac{4}{3}$$

$$y\text{-int} = \underline{\underline{\frac{5}{3}}}$$

(4 marks)

$$(ii) \frac{1}{3}x + \frac{1}{4}y = \frac{1}{12}$$

$$\frac{1}{4}y = \frac{1}{12} - \frac{1}{3}x$$

$$y = 3 - \frac{4}{3}x$$

$$G = -\frac{4}{3}$$

$$y\text{-int} = \underline{\underline{3}}$$

9. Given that  $y = ax^n$ , find the value of y when  $a = \frac{5}{3}$ ,  $x = 2$  and  $n = -4$ .

(3 marks)

$$y = \frac{5}{3} \times 2^{-4}$$

$$y = \frac{5}{3} \times \frac{1}{2^4}$$

$$y = \frac{5}{3} \times \frac{1}{16}$$

$$y = \underline{\underline{\frac{5}{48}}}$$

10. Find the value of  $\frac{1}{27.38}$

(1 mark)

$$1 \times \frac{1}{27.38 \times 10}$$

$$1 \times \underline{\underline{0.0365}}$$