Sec 3 WA2 Mock Paper
Duration: 57 minutes

38

1. **(a)** Simplify $\sqrt{100a^4} \times (-2ab^{-2})^{-3}$, leaving your answer in positive index notation.

Answer ..... [3]

(b) Solve the equation $25 \times 625^{n+1} = 1$.

Answer $n =$ ..... [3]

2. Gary plans to borrow \$15 000 to pay for his motorcycle.
The bank charges an interest rate of 0.9% per annum, compounded monthly.
Calculate the total amount of interest charged by the bank at the end of three years.

Answer \$ ..... [2]

3. An optical fibre in a shape of a cylinder has a radius of approximately 9 micrometres and a total length of 2.71 kilometres.

Given that 1 micrometre = 10^{-6} m, find the volume of the optical fibre in m^3.
Give your answer in standard form, correct to three significant figures.

Answer ..... m^3 [3]

4. Solve the inequalities $15x + 12 < 3(x + 1) \leq 5x + \frac{35}{6}$.

Answer ..... [3]

5. A is the point (4, 5) and B is the point (–3, –2).
Find the coordinates of a point C which lies on the y-axis such that $AC = BC$.

Answer C (..... , ...) [3]

6. The line L_1 passes through the point (–1, 8).
The equation of line L_2 is $2y + 7x - 5 = 0$.
The gradient of line L_1 is equal to the gradient of line L_2.
Find the equation of line L_1.

Answer ..... [3]

7 Louis invests in an account that pays an interest of 2.2% per year compounded half-yearly, for 3 years. At the end of 3 years, there is $4645.95 in that account.

Calculate the total amount of interest Louis earned over the 3 years.

Answer [2]

$ ……..

8 **(a)** Show that $3^{2024} + 3^{2024} + 3^{2024}$ is a multiple of 27.

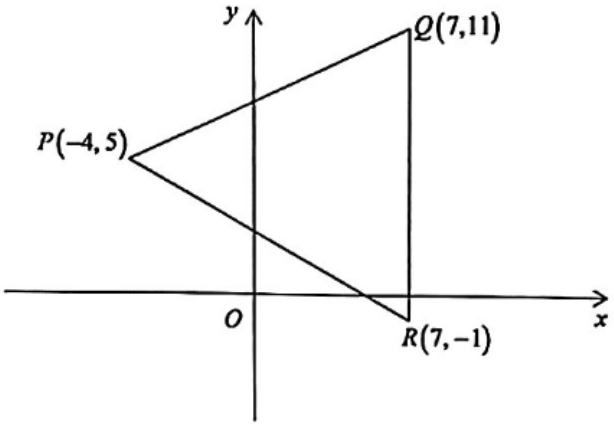
[2]

(b) Simplify $\frac{(9a^{-5}b)^{-\frac{1}{2}}}{b^{-1}} \div (a^0b^3)^{-\frac{2}{3}}$, giving your answer in positive index form.

[3]

Answer ……

9 The diagram below shows a triangle with vertices $P(-4, 5)$, $Q(7, 11)$ and $R(7, -1)$.



(a) Find the area of triangle PQR.

Answer .....units^2 [1]

(b) Find the equation of the line passing through P and Q.

Answer ..... [2]

(c) Justify, with mathematical working, whether PQR is an equilateral triangle.

.....

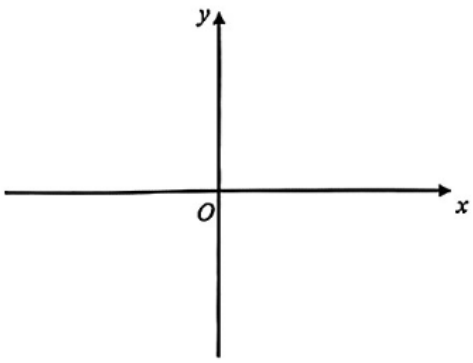
..... [3]

10

(a) Sketch the graph of $y=\left(\frac{1}{2}\right)^{-2x}$ on the axes below.

Indicate clearly the value at which the graph crosses the y-axis.

Answer



[2]

(b) The graph of $y=\left(\frac{1}{2}\right)^{-2x}$ passes through the point $(m,256)$.

Find the value of m.

Answer m = ... [3]

END OF TEST