

Assignment #1

Name _____

The problems in this set are all past I.B. questions from miscellaneous topics from general Algebra, quadratics, exponential functions, etc.

- ① Calculate and round to 2 decimal places

$$\frac{16.84}{7.9 + 11.2} =$$

- ② Write each of the following to 3 significant figures

$$0.06371 \rightarrow \underline{\hspace{2cm}} \quad 256,800 \rightarrow \underline{\hspace{2cm}}$$

- ③ Calculate the percentage error when rounding a crowd size of 15,221 to 12,000 (show work) You can use the IB Formula Packet

- ④ For $y = 2x^4 + 6x^3 + x + 2$ draw a sketch of the graph, label with all axis intercepts, label any local minimums or maximums with their coordinates

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

- what is the equation of the vertical asymptote?
- what is the equation of the horizontal asymptote?
- what is the y-intercept?
- what are (is) the x-intercept(s)?
- sketch the graph below, label it, be sure to draw any asymptotes with a dotted line.

(a) Factorise the expression $x^2 - 25$.

(b) Factorise the expression $x^2 - 3x - 4$.

(c) Using your answer to part (b), or otherwise, solve the equation $x^2 - 3x - 4 = 0$.

6 Consider the line $l: 2x + y + 4 = 0$.

- (a) Write down the gradient of l .
- (b) Find the gradient of a line perpendicular to l .
- (c) Find the equation of a line perpendicular to l , passing through the point $(5, 3)$. Give your answer in the form $ax + by + d = 0$, where $a, b, d \in \mathbb{Z}$.

Working:

Answers:

- (a) _____
- (b) _____

7

Consider the functions $f(x) = x + 1$ and $g(x) = 3^x - 2$.

- (a) Write down
 - (i) the x -intercept of the graph of $y = f(x)$;
 - (ii) the y -intercept of the graph of $y = g(x)$. [2]
- (b) Solve $f(x) = g(x)$. [2]
- (c) Write down the interval for the values of x for which $f(x) > g(x)$. [2]

8

The number of apartments in a housing development has been increasing by a constant amount every year.

At the end of the first year the number of apartments was 150, and at the end of the sixth year the number of apartments was 600.

The number of apartments, y , can be determined by the equation $y = mt + n$, where t is the time, in years.

- (a) Find the value of m . [2]
- (b) State what m represents in this context. [1]
- (c) Find the value of n . [2]
- (d) State what n represents in this context. [1]

9

Consider the quadratic function $y = f(x)$, where $f(x) = 5 - x + ax^2$.

- (a) It is given that $f(2) = -5$. Find the value of a . [2 marks]
- (b) Find the equation of the axis of symmetry of the graph of $y = f(x)$. [2 marks]
- (c) Write down the range of this quadratic function. [2 marks]

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