# 6492MD: Assignment 2

**Before completing this assessment you need to work through**

| either | or |
|---|---|
| Maths in Focus 11 Mathematics Advanced<br>3RD EDITION<br>Published: 21/12/2018<br>ISBN: 9780170413152<br>Author: Margaret Grove<br>Chapter 3 Functions<br>Chapter 4 Trigonometry | Maths in Focus 11 Mathematics Extension 1<br>3RD EDITION<br>Published :08/11/2018<br>ISBN :9780170413299<br>Author : Margaret Grove<br>Chapter 4 Functions<br>Chapter 5 Trigonometry |

# What you need to do

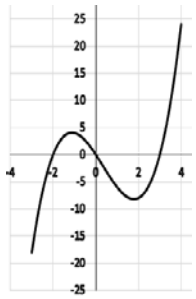
- Attempt all questions.
- **Write your answers using a black pen on your own paper.**
- Show all necessary working. Marks are given for correct working.
- Leave plenty of space around your answers for your teacher's comments.
- If you have studied the work in your textbook, and you are stuck on an assignment question, you can contact us for help.
- It is important to present your work clearly and well to avoid having it returned to you unmarked as a non-serious attempt.

**Write your answers using a black pen on <u>your own paper</u>.**

Ten multiple choice questions: Choose the **correct** answer A B C or D.

**No working** is required for multiple choice questions.

| | | A | B | C | D |
|---|---|---|---|---|---|
| For the straight line $3x - 2y = 3$, | | | | | |
| 1 | the gradient is | $-\frac{3}{2}$ | $\frac{2}{3}$ | 1 | $\frac{3}{2}$ |
| 2 | the $y$-intercept is | $-\frac{3}{2}$ | $\frac{2}{3}$ | 1 | $\frac{3}{2}$ |
| 3 | the $x$-intercept is | $-\frac{3}{2}$ | $\frac{2}{3}$ | 1 | $\frac{3}{2}$ |
| 4 | the angle of inclination of the line with the positive $x$ axis is | 37° | 45° | 56° | 124° |
| 5 | The gradient of the straight line joining (6, 5) and (8, 6) is | | | | |
| | | -2 | $-\frac{1}{2}$ | $\frac{1}{2}$ | 2 |

6 

What is the degree of the polynomial shown in the graph?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | 1 | B | 2 | C | 3 | D | 4 |

7 What is the equation of the polynomial?

| | | | |
|---|---|---|---|
| A | $y = x(x+3)(x-2)$ | B | $y = x(x-3)(x+2)$ |
| C | $y = -x(x+3)(x-2)$ | D | $y = -x(x-3)(x+2)$ |

8 The equation of the line through the points $(3, 4)$ and $(-1, 8)$ is

| | | | |
|---|---|---|---|
| A | $4x + 4y - 7 = 0$ | B | $3x + 4y - 7 = 0$ |
| C | $x + 8y - 7 = 0$ | D | $x + y - 7 = 0$ |

9 The equation of the line through the point $(4, 4)$ and perpendicular to the line $3y = 2x + 2$ is

| | | | |
|---|---|---|---|
| A | $3x + 2y - 20 = 0$ | B | $3x - 2y - 4 = 0$ |
| C | $2x + 3y - 20 = 0$ | D | $2x - 3y + 4 = 0$ |

10 In $\Delta ABC$, $AB = 17$, $BC = 15$, and $CA = 16$. $\angle B$ to the nearest degree is

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A | 54 | B | 60 | C | 66 | D | None of these |

For the following questions, **write your answers using a black pen on <u>your own paper</u>. Show all necessary working.** Marks are given for correct working.

11 Using your answer to question 10 or otherwise, calculate the area of the triangle.

12 Express $\frac{3\pi}{5}$ radians in degrees.

13 An electronics manufacturer sells headphones for \$157.

(a) Write down the equation to find the income $I$ when $N$ headphones are sold.

(b) The fixed cost of production is \$5000 per year. The variable cost is \$43 per headphone. Write down the equation to find the cost $C$ of producing $N$ headphones.

(c) How many headphones must be sold to break even?

(d) Write down the equation linking the manufacturer's profit , and the number of headphones sold $N$.

(e) How many must be sold to make a profit of \$20000?

14 Given $f(x) = ax^2 + b$ and $f(2) = 5,\ f(3) = 20,$ find $a$ and $b$.

15 A triangle $XYZ$ is formed by joining the points $X(-1,3),\ Y(-1,-3),$ and $Z(3,1)$.

Make a sketch of $\Delta XYZ$ on the coordinate axes.

(a) Find the length of the side $YZ$.

(b) Find the equation of the line $YZ$.

(c) What is the gradient and the $y$-intercept?

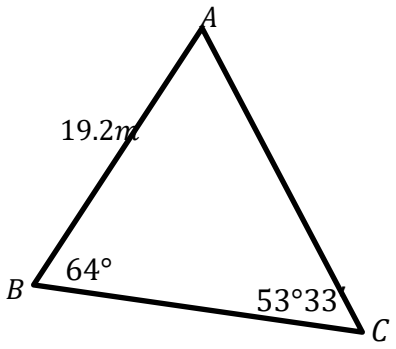
(d) Calculate the distance between $X$ and $YZ$.

(e) Find the area of the triangle $XYZ$.

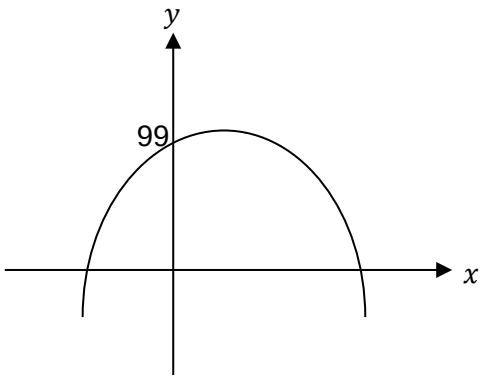
16 Find $d$ if the line passing through $(-2,-1)$ and $(3,2)$ is perpendicular to the line $dx + 2y - 3 = 0$.

17 From the top of a vertical cliff 28 metres high, an observer finds the angle of depression of a boat at sea to be $29°24'$. Five minutes later the angle is $42° 36'$. How far has the boat travelled in this time?

18 In the triangle below, find the length of the side $AC$ correct to the nearest centimetre**.**




19 Below is a sketch of the quadratic function $y = 100 - (x - 1)^2$ .




Indicate whether the following statements are true or false:

(a) The maximum value of $100 - (x - 1)^2$ is 100.

(b) The axis of symmetry is $y = 1$.

(c) The zeros of the function are $11$ and $-9$.

(d) The vertex point is $(1,100)$.

(e) The value of the discriminant is $400$.

(f) The function is even.

20 After an argument, two lost bushwalkers $B1$ and $B2$ decide to walk on different paths. $B1$ walks at $6$ km per hour on a bearing of $335°$. $B2$ walks at $4$ km per hour on a bearing of $030°$. After $90$ minutes $B1$ decides that the argument was stupid and phones $B2$.

(a) How far have $B1$ and $B2$ walked between the argument and the phone call?

(b) Draw a diagram to represent this information (i.e. the mathematical information, not their emotional states).

(c) How far apart are $B1$ and $B2$ when the phone call occurs? Answer to the nearest tenth of a kilometre.

# Checklist

I have:

- answered every question
- written my answers using a black pen on my own paper
- shown necessary working.

If you are unable to complete this task for a specific reason, please contact your teacher to discuss alternative arrangements for demonstrating your skills and knowledge.