

14 February 2019

Dear Mathematics department,

Elite Maths specialises in writing Mathematics assessment such as practice exams and test questions. Having launched in 2016, we have been distributing our work to many schools in Australia.

We are writing to introduce our brand new **Year 10 Topic Tests 2019**. This product consists of a set of test questions for teachers to use for assessments. The topics our questions covers are:

- Number and algebra;
- Linear and nonlinear graphs;
- Measurement and geometry;
- Trigonometry;
- Statistics and probability
- 10A modules.

For sample questions and more information about us, please visit our website <http://www.elitemaths.com.au/trial-exams>. Alternatively, please request sample questions by email.

Currently, we are working on **2019 Elite Trial Exams**, a set of trial exams that covers all of unit 1 & 2 studies (except Foundation Maths), unit 3 & 4 studies and Year 10/10A for early September release.

Please do not hesitate to contact us if you have any questions.

Kind regards,

Will Kim

Elite Maths
Simplify Assessments.

m: +61 481 369 728

e: EliteMathsAU@gmail.com

w: www.EliteMaths.com.au

ABN: 34 523 643 464

Year 10 Topic Tests 2019 information sheet

Year 10 Topic Tests 2019 is a set of short answer questions and their full solutions. The topics covered are:

Year 10 Topics:

- Patterns and Algebra (6 questions);
- Linear and non-linear relationships (5 questions);
- Measurement and Geometry (5 questions);
- Trigonometry (5 questions);
- Probability (5 questions);
- Statistics (5 questions).

10A Topics:

- Number and Algebra (4 questions);
- Non-linear relationships (5 questions);
- Trigonometry & Measurement and Geometry (5 questions);
- Statistics (2 questions).

Year 10 Topic Tests 2019 also includes a **mid-year test** that consists of:

- 10 multiple choice questions (+6 extra 10A questions)
- 5 short answer questions (+ 2 extra 10A questions)
- 2 extended response questions (+1 extra 10A question)

Please also note the following information:

Distribution

We will email zipped copies to you.

File format

MS word docx format (compatible with word 2007/2010/2013/2016).

Sample

We have attached sample questions below.

Release date

1st of March.

Price

\$100.

Patterns and Algebra Test

Time allowed: 1 hour

Total marks: 40 marks

Question 1 (7 marks)

(a) Evaluate $\frac{2}{4} \times (-8) + 3$. 1 mark

(b) Write $3^2 \times 3^4$ as a single power of 3. 1 mark

(c) Simplify $\frac{x^6}{x^4}$. 1 mark

(d) Evaluate each the following:

(i) 2^0 1 mark

(ii) $125^{\frac{2}{3}}$ 1 mark

Question 3 (10 marks)

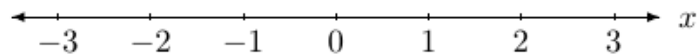
(a) Multiply out the brackets and collect like terms for $(2x + 5)(-x + 2)$. 2 marks

(b) Factorise $x^2 - 15x - 16$. 1 mark

(c) Express $x^2 + 16x + 23$ in the form $(x + a)^2 - b$. 2 marks

(d) Write $\frac{x+1}{2} - \frac{x-1}{5}$ as a single fraction. Simplify your answer. 2 marks

(e) Represent the solution set of $\left\{x \in \mathbf{R} : \frac{x}{2} + 3 \geq 2, \frac{x+3}{3} < 2\right\}$ on the number line below. 3 marks



Linear and non-linear relationships Test

Time allowed: 1.5 hours

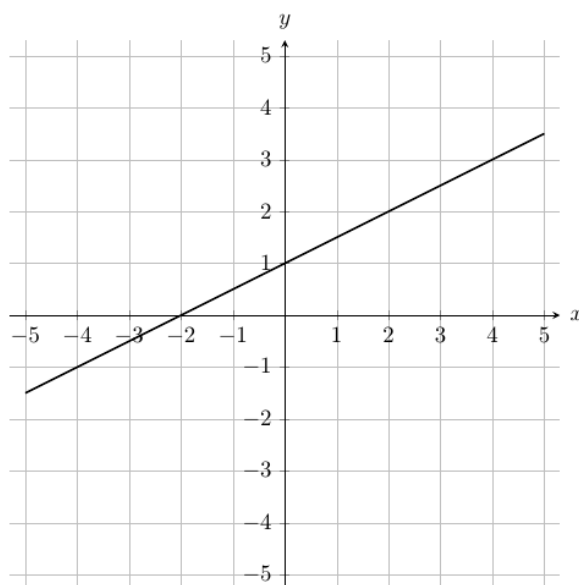
Total marks: 40 marks

Question 1 (9 marks)

Sketch the graph for each of the equations given below:

(a) $y = \frac{1}{2}x + 1$;

1 mark

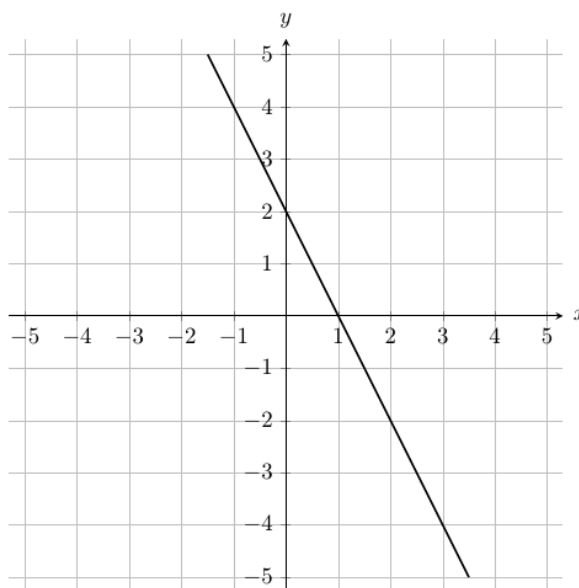


• correct graph (A1)

(b) $2x + y - 2 = 0$;

1 mark

$2x + y - 2 = 0$ can also be written as $y = -2x + 2$.



• correct graph (A1)

Question 2 (8 marks)

(a) Find the gradient of the line with equation $2x + 5y = 1$.

1 mark

$$2x + 5y = 1$$

$$5y = -2x + 1$$

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

Since the equation is in the form $y = mx + c$, the gradient of the line is $-\frac{2}{5}$. (A1)

(b) Find the equation of the line with gradient -2 , which passes through the point $(3, 1)$.

1 mark

The equation can be written as $y = -2x + c$, where c is a constant.

Since this line passes through $(3, 1)$

$$-2 \times 3 + c = 1$$

$$-6 + c = 1$$

$$c = 7$$

Therefore, the equation is $y = -2x + 7$. (A1)

(c) Find the equation of the line with a gradient of zero, that passes through the point $(-2, 3)$. 1 mark

$$y = 3 \text{ (A1)}$$

(d) Find the equation of the line that passes through the points $(-1, 2)$ and $(1, 4)$.

2 marks

The gradient of the line is:

$$\text{gradient} = \frac{4 - 2}{1 - (-1)}$$

$$= \frac{2}{2}$$

$$= 1 \text{ (A1)}$$

The equation of this line can be in the form $y = x + C$, where C is a constant.

Since the line passes through $(1, 4)$

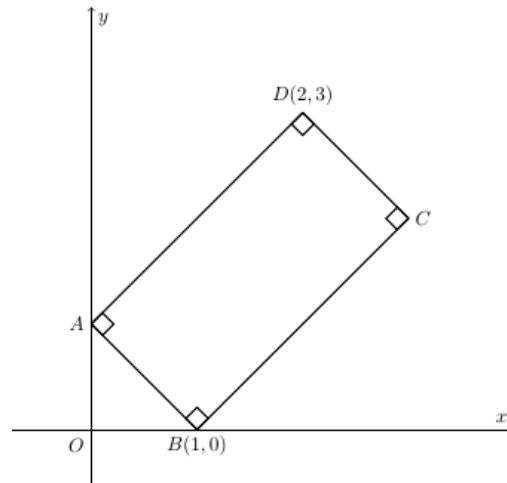
$$1 + C = 4$$

$$C = 3$$

Therefore, the equation of the line is $y = x + 3$. (A1)

Question 3 (7 marks)

ABCD is a rectangle. B is a point on the x -axis and A is a point on the y -axis. The equation of the line that passes through the points A and D is $y = x + 1$. The coordinates of B and D are $(1, 0)$ and $(2, 3)$ respectively.



- (a) Show that the coordinates of point A are $(0, 1)$. 1 mark

Since point A is the y -intercept of the line $y = x + 1$, set $x = 0$, which gives $y = 1$.

$$A = (0, 1) \quad (A1)$$

- (b) Show that AB has a length of $\sqrt{2}$ units. 2 marks

$$\begin{aligned} AB &= \sqrt{(1-0)^2 + (1-0)^2} \quad (A1) \\ &= \sqrt{1+1} \\ &= \sqrt{2} \quad (A1) \end{aligned}$$

- (c) Find the equation of the line that passes through the points A and B. 2 marks

Since line AB is perpendicular to AD

$$\begin{aligned} m_{AB} \times 1 &= -1 \\ m_{AB} &= -1 \quad (A1) \end{aligned}$$

The equation of line AB can be written as

$$y = -x + C.$$

Since line AB passes through $(1, 0)$

$$\begin{aligned} -1 + C &= 0 \\ C &= 1. \end{aligned}$$

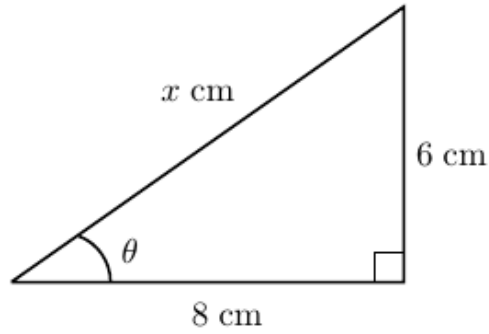
Hence, the equation of line AB is $y = -x + 1$. (A1)

Trigonometry Test

Time allowed: 1 hour

Total marks: 23 marks

Question 1 (6 marks)



(a) Calculate the value of x .

2 marks

(b) Calculate the value of θ . Round your answer to one decimal place.

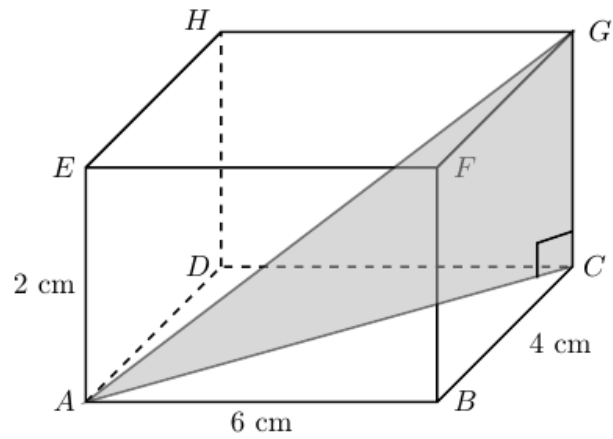
2 marks

(c) Find the area of the triangle.

2 marks

Question 4 (4 marks)

ABCDEFGH is a rectangular prism.



(a) Find the length of line segment AC . Round your answer to two decimal places.

2 marks

(b) Find the size of angle AGC . Round your answer to one decimal place.

2 marks

Statistics Test

Time allowed: 1 hour
Total marks: 30 marks

Question 1 (10 marks)

An animal keeper observed and collected the number of hours each of 9 animals spent sleeping on a particular day at a zoo.

4 8 9 11 12 13 18 19 23

- (a) State the underlying population. 1 mark

All of the animals in the zoo.

- (b) Find the mean and median. 2 marks

$$\begin{aligned} \text{mean} &= \frac{4+8+\dots+19+23}{9} \\ &= 13 \quad (A1) \end{aligned}$$

$$\text{median} = 12 \quad (A1)$$

- (c) Find the lower quartile (Q_1) and the upper quartile (Q_3). 2 marks

$$Q_1 = \frac{8+9}{2} = 8.5 \quad (A1)$$

$$Q_3 = \frac{18+19}{2} = 18.5 \quad (A1)$$

- (d) Calculate $Q_1 - 1.5 \times IQR$ and $Q_3 + 1.5 \times IQR$. Hence, determine if there are any outliers. 3 marks

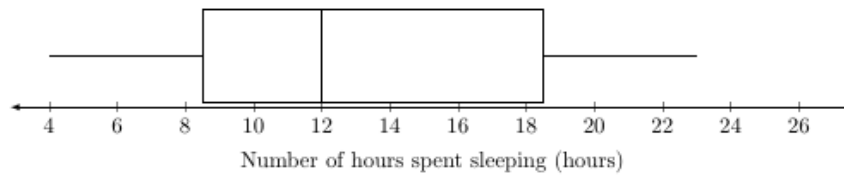
$$\begin{aligned} \text{Lower Fence} &= Q_1 - 1.5 \times IQR \\ &= 8.5 - 1.5 \times (18.5 - 8.5) \\ &= -6.5 \quad (A1) \end{aligned}$$

$$\begin{aligned} \text{Upper Fence} &= Q_3 + 1.5 \times IQR \\ &= 18.5 + 1.5 \times (18.5 - 8.5) \\ &= 33.5 \quad (A1) \end{aligned}$$

There are no numbers less than -6.5 or greater than 33.5 . Hence, there are no outliers in the data. (A1)

(e) Draw a box plot to summarise the data in the space provided below.

2 marks



- award $(A1) \times 2$ for constructing the correct box plot with the correct 5 number summary
- penalise if the box plot includes any incorrect statistics

**INSERT
SCHOOL LOGO**

YEAR 10 MATHEMATICS

MIDYEAR TEST

Reading time: 15 minutes

Writing time: 2 hours

QUESTION BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of marks
A	10	10	10
B	5	5	25
C	2	2	10
			Total 45

End of sample questions