Multiple-choice section – choose the correct answer

Question 1 [1.1]

The solution to the equation 7 –  = -3 is:

A 5 B -6 C -4.8 D 12

Question 2 [1.1]

The solution to the equation 5(a – 2) = 3(a + 2) is:

A 2 B 8 C 6 D -2

Question 3 [1.2]

The gradient of the equation 4x – 2y = 8 is:

A 4 B 8 C 2 D 

Question 4 [1.2]

The gradient of the line with equation x = 7 is:

A undefined B 7 C 1 D 0

Question 5 [1.3]

The equation of a linear graph with a y-intercept of 5 and a gradient of - is:

A 3y = 2x + 15 B y + 5 = -x C 3y + 15x = -2 D 2x + 3y = 15

Question 6 [1.4]

The line that is parallel to the line with the equation y = -2x + 1 is:

A 2x + y = -2 B y – 2x = 12 C x – 2y = 4 D 2x – y = 6

Question 7 [1.4]

The gradient of a line that is perpendicular to the line with equation  is:

A 2 B -2 C  D 

Question 8 [1.5]

The solution to the inequality  is:

A x = 5 B x < 5 C x > 5 D 

Question 9 [1.5]

Which of the following is not a solution of  < 1?

A x = 0 B x = -1.5 C x = -0.9 D x = 2.1

Question 10 [1.6]

The simultaneous equations y = -2x + 10 and 2y + 3x = 14 have the solution:

A x = -6, y = 22 B x = 0, y = 10 C x = 2, y = 6 D x = 6, y = -2

Multiple-choice results: \_\_\_ / 10

Short answer section

Question 11 11 marks

Use words from the list below to complete the following sentences.

linear relationship y = mx + b perpendicular linear equation inequality one inverse operations gradient parallel rise over run y-intercept

(a) A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ exists between two variables when the graph of the relationship is a straight line.

(b) A linear relationship is described by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

(c) Linear equations can be solved by applying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to both sides of the equation.

(d) The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of a line is a measure of its steepness, which can be evaluated by evaluating the fraction \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

(e) The general equation of a straight line is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where m is the gradient of the line and b is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the line.

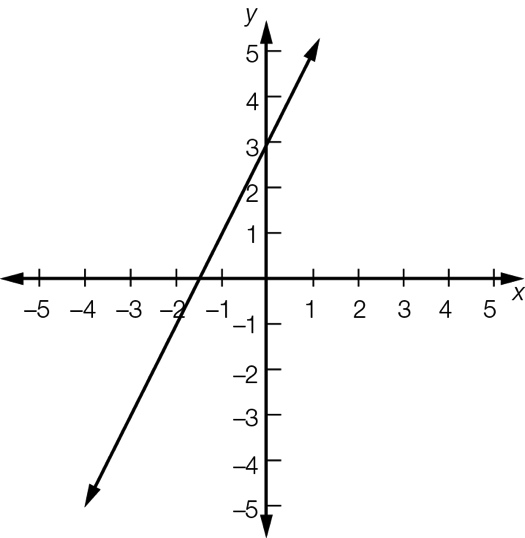
(f) Lines that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ have the same gradients.

(g) Lines that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ meet each other at an angle of 90°.

(h) A linear equation has \_\_\_\_\_ solution and a linear \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has a range of solutions according to the inequality.

Question 12 4 marks [1.3, 1.4]

The line with equation y = 2x + 3 is shown on the graph. State an equation of a line that is (a) parallel to and (b) perpendicular to the line y = 2x + 3. Sketch both lines on the graph below.



Question 13 3 marks [1.1]

Solve the following equation.



Question 14 4 marks [1.1]

Solve the following equation.



Question 15 2 marks [1.2]

Find the gradient of the line joining the points (1, 3) and (4, 9).

Question 16 2 marks [1.3]

Sketch the graph of y = -3x + 2.

Question 17 4 marks [1.4]

(a) Show that the line with equation  is parallel to the line with equation .

(b) Show that the line with equation  is perpendicular to the line with equation .

Question 18 4 marks [1.5]

Solve the following inequalities.

(a) 3x + 1 ≥ 16 (b) 5x – 3 < 7

Question 19 4 marks [1.6]

Solve this pair of simultaneous equations.

y = 3x – 10

2x – 3y = 16

Question 20 4 marks [1.6]

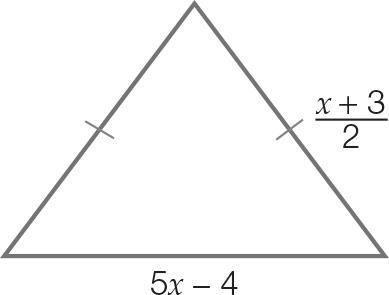
Solve this pair of simultaneous equations.

2x + 3y = 16

5x – 2y = 2

Question 21 3 marks [1.1]

A triangle has the dimensions shown. If the perimeter is 29 cm, calculate the lengths of the sides of the triangle. What is wrong with this triangle?



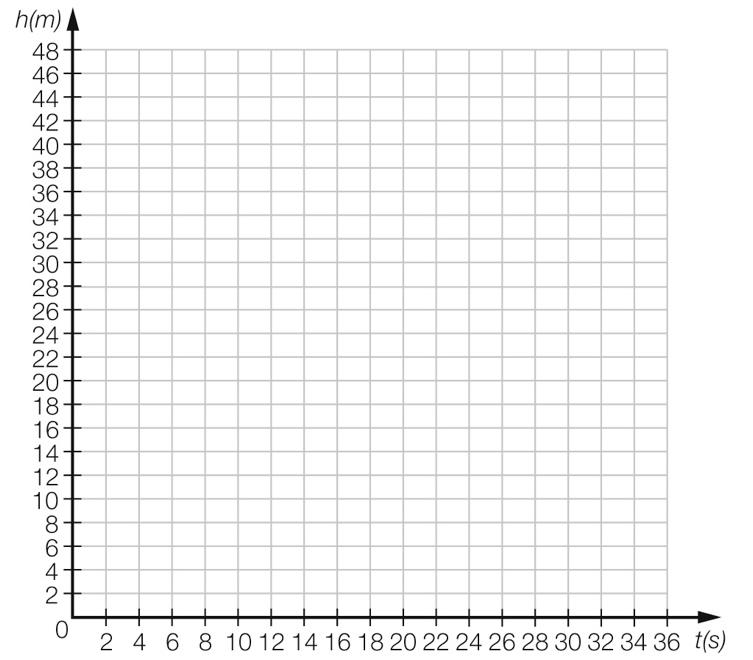
Short answer total:\_\_\_\_\_\_\_\_\_/45

Extended answer section

Question 22 6 marks [1.2, 1.3, 1.4]

An elevator is descending towards the basement of a building at a steady rate. It descends 4 metres every 3 seconds and it reaches the basement (h = 0) after 33 seconds.

(a) Sketch a graph that describes the relationship between the height, h, of the elevator and the time, t.



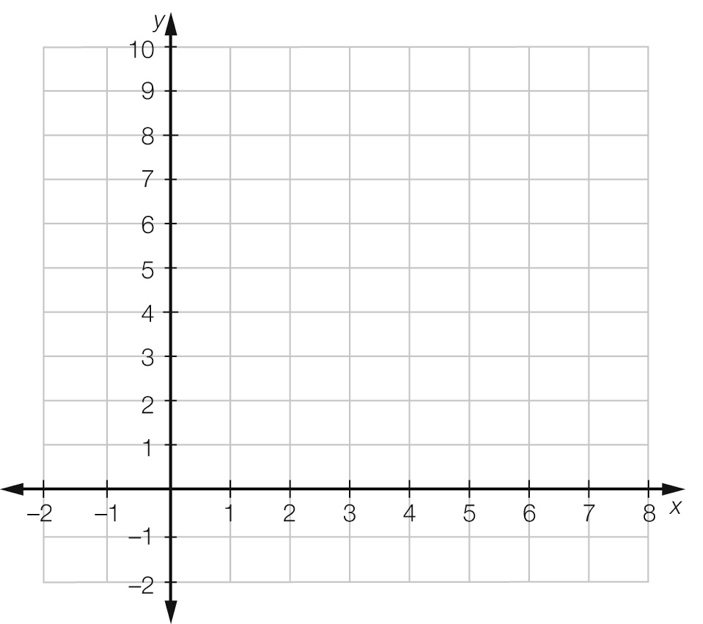
(b) Find the gradient of the graph and hence, the rate of descent of the elevator.

(c) Write an equation that describes the relationship between the height h of the elevator and the time t.

(d) How high is the elevator in the building when t = 0?

Question 23 10 marks [1.2, 1.3, 1.4]

(a) Sketch the line with equation  on the set of axes below.



(b) (i) Draw the line AB that passes through the points  and  and find the equation  
of the line AB.

(ii) Prove that the line with equation  is parallel to the line AB.

(c) (i) Draw the line CD that passes through the points  and  and find the equation  
of the line CD.

(ii) Prove that the line with equation  is perpendicular to the line CD.

Question 24 4 marks [1.6]

A baker uses dried fruit in the fruit buns she makes. She has already used half the contents of the last 5 kg bag she has and wants to know how many more buns could possibly be made before she gets the new supply. Each bun uses 12 g of dried fruit ingredients.

(a) Write an inequality that describes the baker’s situation.

(b) Solve the inequality to find out how many buns could be made.

Question 25 5 marks [1.5]

Chris bought 2 apples and 3 bananas for 80 cents. Sally bought 1 apple and 5 bananas for 75 cents.  
How much did each piece of fruit cost?

Extended answer total:\_\_\_\_\_\_\_/25

TOTAL test results: \_\_\_\_\_ / 80