

Student Name: _____	Grade: _____
Date: _____	Score: _____

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Marks:	20	40	40	100
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2 Year 9 Term 4 Week 3 Homework

2.1 Simultaneous Equations

2.1.1 The substitution method

Exercise 2.1.1 Solve each pair of the following simultaneous equations using the substitution method:

1. $x + 2y = 17$

$$2x + y = 13$$

2. $x - 2y = 9$

$$2x + y = 8$$

3. $x + y = 10$

$$2x + 3y = 27$$

4. $x + y = 14$

$$3x - y = 10$$

5. $x - y = -6$

$$5x + 6y = 25$$

2.1.2 The elimination method

Exercise 2.1.2 Solve each pair of the following simultaneous equations using the elimination method:

1. $2x + y = 10$
 $x + y = 4$

2. $x + 4y = 3$
 $x + y = 6$

3. $x + 3y = 10$
 $3x + y = 14$

4. $2x - y = -3$
 $5x + 2y = 15$

5. $x - 3y = 4$
 $-x - 2y = -14$

Exercise 2.1.3 Further applications

1. $\frac{x}{3} + y = 9$
 $\frac{x}{6} + 2y = 4$

2. $\frac{x}{4} + \frac{y}{3} = 8$
 $\frac{x}{8} - \frac{y}{12} = 4$

3. $\frac{10-x}{3} - \frac{y}{4} = 6$
 $\frac{9-y}{5} + \frac{3x}{4} = 8$

4. $2a + 3b - c = 18$
 $5a + b - 4c = 1$
 $3a + 2b + 2c = 6$

2.1.3 Solving problems using simultaneous equations

1. A drink and three ice-creams cost \$7.20, while three drinks and two ice-creams cost \$10.40. Find the cost of each.

2. In the HSC George's exam result for maths exceeded his school assessment result by 8 marks. The total of the two results was 168 marks. Find George's exam result and school assessment result.

3. The length of a rectangle is three times as long as its width and the total perimeter is 128 cm. Find the area of the rectangle.

4. Three times the sum of two numbers exceeds seven times their difference by 14, while half the difference of the numbers is equal to 12 less than their sum. Find the sum of these two numbers.

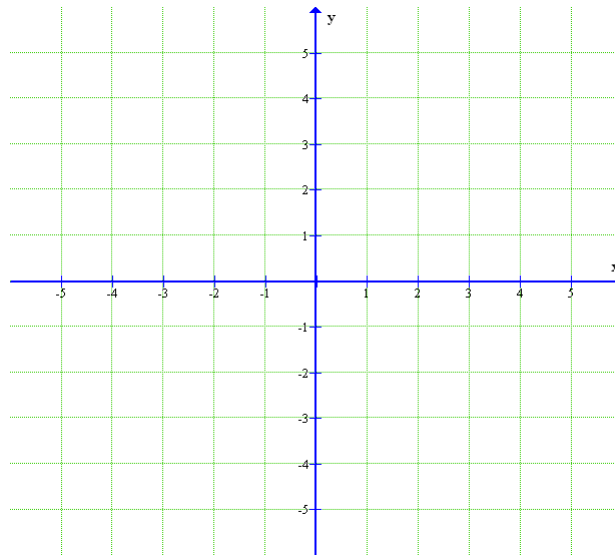
2.2 Diagnostic Test

Question 1 (20 marks)

Graph each pair of equations in the same number plane and find their point of intersection. Hence, find the solution to each pair of simultaneous equations:

(a) $x + y = 1$
 $2x + 3y = 6$

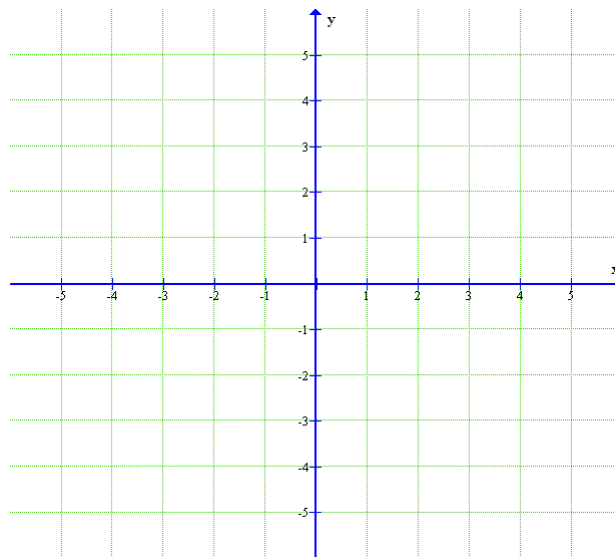
[10]



(a) _____

(b) $x - y = -2$
 $x - y = 3$

[10]



(b) _____

Question 2 (20 marks)

Solve these simultaneous equations using either the substitution or the elimination method:

(a) $x - 4y = 29$

$4x + 3y = 2$

[10]

(a) _____

(b) $3x - 4y = -1$

$4x - 7y = 2$

[10]

(b) _____

Question 3 (10 marks)

A man is four times the age of his son and sum of their ages is 45 years. How old is each person?

3. _____

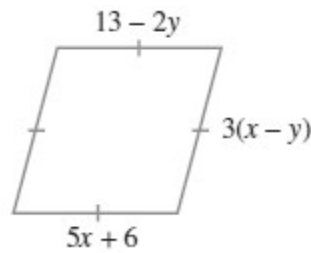
Question 4 (10 marks)

The adjacent sides in a parallelogram are in the ratio 3:4 and the total perimeter is 112 cm. Find the length of the sides.

4. _____

Question 5 (20 marks)

Use a geometric property to form a pair of simultaneous equations, solve for x and y and then find the length of the sides.



5. _____

Question 6 (20 marks)

Solve simultaneously to find for a and b:

$$\frac{a}{3} + \frac{b}{2} = 4$$
$$\frac{5a}{2} + \frac{3b}{4} = 12$$

6. _____

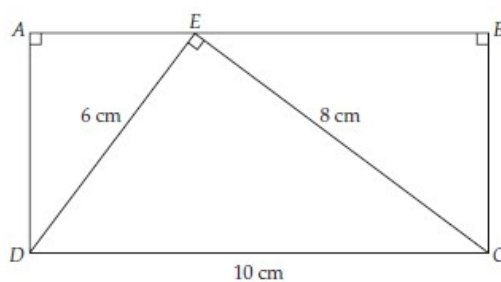
2.3 Miscellaneous Exercise

Exercise 2.3.1

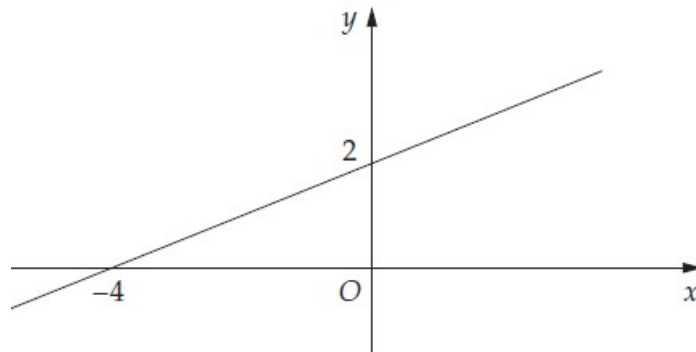
- EFGH is a parallelogram. MH is perpendicular to EF. Which of the following lengths are sufficiently information to find the area of the EFGH?*

 - A.** *The length of HG and EH only*
 - B.** *The length of HG and MH only*
 - C.** *The length of diagonals EG and HF only*
 - D.** *The length of EH and MH only*
- Mary won \$2400. She donated one third of her winnings to charity. After buying herself a \$120 dress, she divided the remainder between her saving account and her investment account in the ratio 3:5. How mush did she deposit in her saving account?*

- Find the area of rectangle ABCD shown below:*



4. For the following diagram, indicate whether each of the following statements is True or False.



- A. The gradient of the line is $\frac{1}{2}$.
 - B. The equation of the line is $y = -4x + 2$.
 - C. The point $(2, 3)$ lies on the line.
 - D. The coordinates of the x-intercept are $(0, -4)$.
5. A total of 1080 men and women participated in a marathon race. After $\frac{2}{9}$ of the women and 180 men dropped out of the race, the ratio of the remaining men and women became 3:1. What was the ratio of men to women at the beginning of the marathon race?

6. A motorist travelled $\frac{5}{8}$ of his journey at an average speed of 60 km/h and completed the remaining 270 km of his journey in 3 hours and 50 minutes. How much longer did he take to complete the first part of his journey than the second part?
