

<b>Student Name:</b> _____	<b>Grade:</b> _____
<b>Date:</b> _____	<b>Score:</b> _____

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## 2 Year 9 Term 4 Week 2 Homework

### 2.1 The Linear Function

**Exercise 2.1.1** For each of the following, state the gradient and y-intercept.

1.  $y = -3x - 5$  \_\_\_\_\_

2.  $y = \frac{1}{3}x - 4$  \_\_\_\_\_

3.  $y = -\frac{1}{2}x + 3$  \_\_\_\_\_

4.  $y = -\frac{2}{3}(x - 3)$  \_\_\_\_\_

**Exercise 2.1.2** Write down the equation of the line that has:

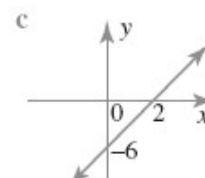
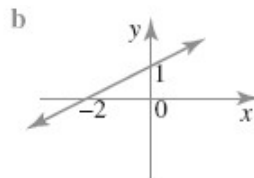
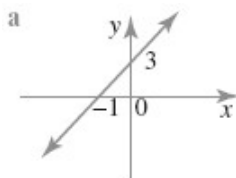
1. a gradient of -3 and y-intercept of 3 \_\_\_\_\_

2. a gradient of 2 and y-intercept of -7 \_\_\_\_\_

3. a slope of  $-\frac{1}{2}$  and passes through the origin \_\_\_\_\_

4. a gradient of -2 and cuts the y-axis at 5 \_\_\_\_\_

**Exercise 2.1.3** Find the gradient and y-intercept of each of the following lines:



**a** gradient = \_\_\_\_\_, y-intercept = \_\_\_\_\_

**b** gradient = \_\_\_\_\_, y-intercept = \_\_\_\_\_

**c** gradient = \_\_\_\_\_, y-intercept = \_\_\_\_\_

## 2.2 Simultaneous Equations

### 2.2.1 Equation with two unknowns

**Exercise 2.2.1** Solve the following by using a guess and check approach or by completing a table of values:

1. John is three times as old as Ken and the sum of their ages is 72 years. How old is each person?

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2. George is 15 cm taller than David and the sum of their heights is 347 cm. How tall is each boy?

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3. Linda paid \$1.84 for eight apples while Emma paid the same amount for two apples and three pears. Find the cost of each piece of fruit.

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4. The length of a rectangle is 8 cm more than the width and the perimeter is 48 cm. Find the area of the rectangle.

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**Exercise 2.2.2** Complete the following table to find integers  $x$  and  $y$  which satisfy the equations

$$x + y = 7 \text{ and } 2x + 5y = 23$$

$x$	$y$	$x + y$	$2x + 5y$
0	7		
1	6		
2	5		
3	4		
4	3		

### 2.2.2 The graphical method

To solve a pair of simultaneous linear equations graphically:

- graph the straight lines on the same number plane
- find the co-ordinates of the point of intersection
- write the solution that corresponds to this point.

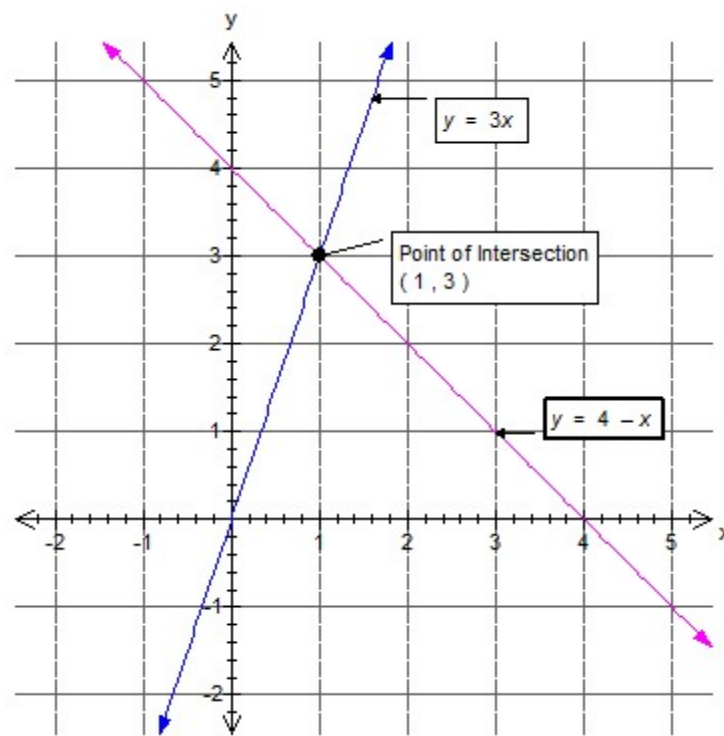
**Example 2.2.1** Solve graphically the simultaneous equations  $y = 3x$  and  $y = 4 - x$

For  $y = 3x$

$x$	0	1	2
$y$	0	3	6

For  $y = 4 - x$

$x$	0	1	2
$y$	4	3	2



The lines intersect at  $(1, 3)$ .

Therefore, the solution is  $x = 1$ ,  $y = 3$ .

**Exercise 2.2.3 Graph each pair of equations on the same number plane and find their point of intersection.**

1.  $y = x + 3$  and  $y = 2x + 1$

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2.  $y = 3x$  and  $y + 2x = 5$

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3.  $y = x - 6$  and  $y = -2x$

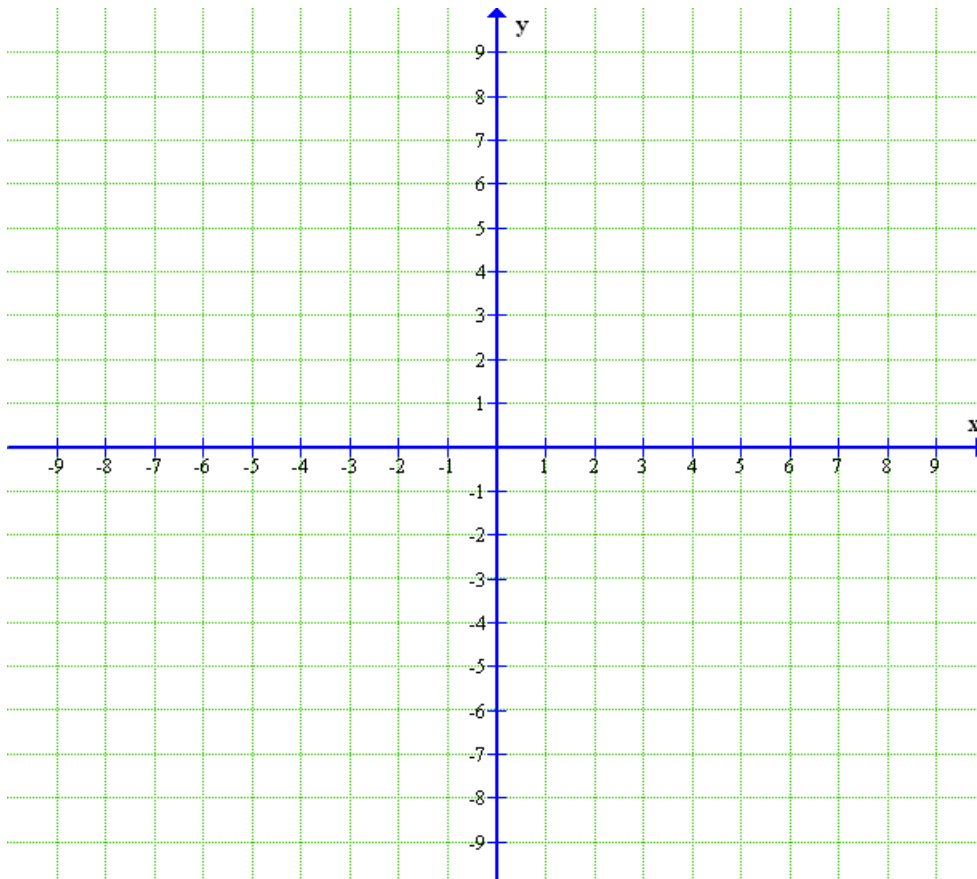
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**2.2.3 The substitution method**

To solve a pair of simultaneous equations using the substitution method:

- number the equations
- make one of the pronumerals the subject of one equation
- substitute this expression into the other equation and solve the resulting equation
- substitute this solution into either of the original equation to find the value of the other pronu-  
meral.

**Exercise 2.2.4 Solve each pair of equations using the substitution method:**

1.  $x + y = 8$

$$x - y = 4$$

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2.  $x + y = 6$

$$x = y - 10$$

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3.  $3x + y = 12$

$$y = 2x - 12$$

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4.  $x - 2y = 6$

$$y = x - 2$$

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**Exercise 2.2.5** Make either  $x$  or  $y$  the subject of one equation, then substitute into the other equation to solve the following simultaneous equations

1.  $x + y = 9$   
 $x + 7y = 21$

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

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3.  $4x + y = 8$   
 $5x - 3y = 10$

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4.  $2x - y = 4$   
 $3x - 8y = 32$

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**2.2.4 The elimination method**

To solve a pair of simultaneous equations using the elimination method:

- number the equations
- add the corresponding terms if two like pronumerals have co-efficients which are numerically equal but opposite in sign, or subtract the corresponding terms if two like pronumerals have co-efficients which are numerically equal and have the same sign
- multiply one or both equations by a constant such that two like pronumerals will have numerical equal co-efficients.
- solve the resulting equation
- substitute this solution into either one to find the value of the other pronumeral.

**Exercise 2.2.6 Solve each pair of simultaneous equations using elimination method by adding or subtracting equations.**

1.  $3x + y = 14$

$$x - y = 2$$

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2.  $7x + 4y = -29$

$$-7x + 5y = 11$$

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3.  $11x - 2y = 30$

$$3x - 2y = -2$$

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## 2.3 Miscellaneous Exercise

**Exercise 2.3.1 Solve the following pairs of simultaneous equations:**

1.  $2x + 3y = 8$

$$3x + 2y = 7$$

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2.  $3x - 4y = -1$

$$4x - 7y = 2$$

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3.  $\frac{x}{2} + \frac{y}{4} = 5$

$$\frac{4x}{3} + \frac{5y}{8} = 13$$

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4.  $x + y + z = 9$

$$y = 5x - 6$$

$$z = 2y - 5$$

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