

Year 9 Term 2 Homework

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

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1 Year 9 Term 2 Week 1 Homework

1.1 Equations, inequations and formulae

1.1.1 Evaluate the Subject of a Formula

Exercise 1.1.1 Substitution into a formula

1. If $A = P(1 + \frac{r}{100})^n$, find the A when $P = 10000$, $r = 20$ and $n = 2$.

2. If $T = \frac{n}{2}[2a + (n - 1)d]$, find T if $a = 6$, $d = 3$ and $n = 8$.

3. If $M = \frac{1}{M_1} - \frac{1}{M_2}$, find M when $M_1 = 1.2$ and $M_2 = 0.6$

4. If $V = \frac{4}{3}\pi r^3$, find the value of:

(a) r correct to 1 decimal place when $V = 288\pi$.

(b) r correct to 1 decimal place when $V = 200$.

1.1.2 Changing the Subject of a Formula**Exercise 1.1.2 Make y the subject:**

1. $6x - 12 = 3y - 2x$

2. $xy - 7 = ax + by$

3. $3(4x - 2y) = 15x - 3$

4. $2y = \frac{3xy}{5} - 4$

5. $x^2 = y^2 - 8x$

6. $\frac{y}{y-6} = \frac{2x}{3}$

1.1.3 Inequations

An **inequation** is a number sentence in which two quantities are not equal.

Graphing solutions on the number line:

- place the number that occurs in the solution at the centre of the number line segment.
- draw a closed dot \bullet on this number if the inequality sign is \geq or \leq .
- draw an open dot \circ on this number if the inequality sign is $>$ or $<$.
- from the dot, draw an arrow along the number line in the direction indicated by the inequality sign.

When multiplying or dividing both sides of an inequation by a negative number, reverse the inequality sign.

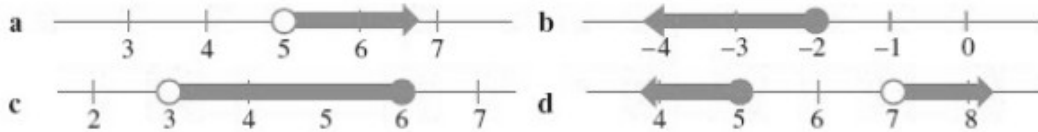
Example 1.1.1 Graph each of these inequation on a number line

a. $x > 5$

b. $x \leq -2$

c. $3 < x \leq 6$

d. $x \leq 5$ or $x > 7$



Example 1.1.2 Solve each of the following inequations:

1. $4x + 2 < 26$

$$4x \leq 24$$

$$x \leq 6$$

2. $5x = 3 \geq 2x + 12$

$$5x - 2x \geq 12 - 3$$

$$3x \geq 9$$

$$x \geq 3$$

3. $9 \leq \frac{x}{4} - 3$

$$6 \leq \frac{x}{4}$$

$$24 \leq x$$

$$\therefore x \geq 24$$

Exercise 1.1.3 Solve the following inequations and graph the solution on a number line.

1. $3x - 1 \geq 14$

2. $19 < 2x + 7$

3. $6 \leq 8(3x - 2)$

4. $2 - 4x \leq 14 - x$

5. $\frac{x-2}{4} \leq 3$

6. $15 + \frac{x}{2} \geq 8$

7. $2 - \frac{x-2}{4} \geq 5$

8. $\frac{2x}{3} - \frac{x}{5} \geq 21$

1.1.4 Problem Solving**Exercise 1.1.4 Solve the following inequation problems:**

1. *If a certain integer is increased by 3 and the result is greater than 7 but less than 13. Find all possible values for the integer.*

2. *Two sides of a given triangle are 10 cm and 26 cm. What is the range of the possible lengths for the third side of the triangle?*

3. *A rectangle is to be constructed with length x cm and width $(x-7)$ cm. The perimeter of the rectangle is to be less than 36 cm. What are the possible values for x ?*

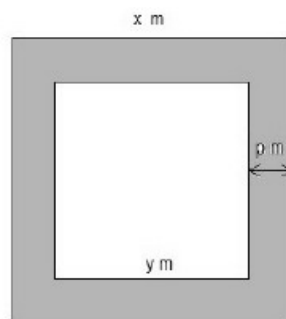
4. *The sum of 3 consecutive integers is greater than 9 but no more than 20. What could the integers be?*

Exercise 1.1.5 Solve the following problems:

1. Find two numbers such that their sum is 20, while half their difference is 1.

2. A 2.8 m length of timber is cut into 4 pieces. One piece is twice the length of the shortest piece and the others are 30 cm longer than the shortest piece. Find the length of each piece of timber.

3. Consider a square garden with sides x metres long. A path p metres wide surrounds a square area of lawn with side y metres, as shown in the figure below:



- (a) Write down a formula for y in terms of x and p .

- (b) If $x = 16$ m and $p = 2$ m, find the area of the path.

1.2 Maths Challenge

Exercise 1.2.1

1. If $a\#b = ab - 1$, find the value of $\frac{(2\#3)\#5}{2\#(3\#5)}$.

2. Let $x = \frac{1}{2}(\sqrt[3]{7} - \frac{1}{\sqrt[3]{7}})$, find the value of $(x + \sqrt{1 + x^2})^3$.

3. If $\frac{x+y}{x-y} = 1\frac{3}{4}$, find the value of $\frac{x^2}{y^2}$.

4. If “&” represents an operation defined as $x\&y = x^y + y^x$, find the value of $(2\&3)\&2$.
