Year 9 Term 1 Homework

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

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8 Year 9 Term 1 Week 8 Homework

8.1 Equations, inequations and formulae

8.1.1 Equations with grouping symbols

Exercise 8.1.1 Solve the following equations:

1. $4(3x - 2) = 2(5x - 3)$

2. $12 - 3(2y - 4) = 3(4y + 8) + 6$

3. $28a - 3(3a - 4) = 4(2a - 7) + a$

4. $5(b - 3) + 9 = 18 - 3(3b - 4) + 2b$

5. $2(4c + 12) - 2c = 6(2 - 3c) + 8$

8.1.2 Equations with one fraction

Exercise 8.1.2 Further Applications

1. $\frac{a-3}{4} - 2 = 8$

2. $\frac{6b+2}{3} + 4 = 12$

3. $\frac{c-12}{5} - 3c = 6$

4. $\frac{2x}{6} = 5x - 6$

5. $\frac{6}{2x} - 8 = 4$

6. $\frac{1}{4}(2y + 4) = 2y$

8.1.3 Equations with more than one fraction

Exercise 8.1.3 Solve the following equations (Multiply both sides by the LCM).

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

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

3. $\frac{a-3}{12} = \frac{1}{4}$

4. $\frac{2b}{4} - \frac{5b}{3} = \frac{1}{4}$

5. $\frac{1}{2} + \frac{2c}{9} = \frac{c}{3}$

8.1.4 Evaluate the subject of a formula

A formula is an algebraic statement that shows the relationship between various quantities. Most formulae are written with a single pronumeral on the left-hand side. This pronumeral is called subject of the formula.

Example 8.1.1 If $E = \frac{1}{2}my^2$, find the value of E when m = 12.5 and v = -3.

Solution: $E = \frac{1}{2}my^2$
$= \frac{1}{2} \times 12.5 \times (-3)^2$
$= 56.25$

Exercise 8.1.4 Find the value of the subject in each formula given that:

1. $v = u + at$.

   (a) *when u = 6, a = 2.5 and t = 12.*

   (b) *when u = 12, a = $\frac{1}{2}$ and t = 9*

2. $y = mx + b$

   (a) *when m = 4, x = 8 and b = -5.*

   (b) *when m = $-\frac{1}{4}$, x = 6 and b = 4.*

3. $S = \frac{n}{2}(a + l)$

   (a) *when n = 15, a = 3 and l = 12.*

   (b) *when n = 8, a = -5 and l = 7.*

8.1.5 Problem Solving

Exercise 8.1.5 Solve the following worded problems

1. *The perimeter of a parallelogram is 56 cm and one side is 4 cm shorter than the adjacent side. Find the lengths of the sides.*

2. *The cost of a new tyre is $70 more than the cost of a retread. If the cost of two new tyres and two retreads is $580, what is the unit cost of each tyre?*

3. *Jeffrey is half the age of his father. the sum of their ages is 87 years. How old is each person?*

4. *Six years ago, John was twice the age of Tom. At present, John is 30 years older than Tom. Find the present age of each man.*

5. *If the numerator and denominator in the fraction $\frac{5}{11}$ are increased by a certain number, the resulting fraction would then be $\frac{2}{3}$. Find the number.*

Exercise 8.1.6 Further applications

1. $\frac{2}{3a} - \frac{1}{6} = -\frac{1}{2}$

2. $\frac{3}{4} + \frac{5}{2b} = \frac{-2}{b}$

3. $\frac{1}{c} + \frac{1}{c-1} = \frac{5}{c}$

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

5. *A number is multiplied by 5, then decreased by 30. The result is equal to 18 more than double the number. Find the number.*

Exercise 8.1.7 Consolidation

1. *In a group of 32 men and women, there are 4 more men than women. How many people of each gender are there?*

2. *An isosceles trapezium has two equal sides of length 9 cm. One of the parallel sides is 6 cm longer than the other parallel side. If the trapezium has a perimeter of 46 cm, what are the lengths of the parallel sides?*

3. *The sum of two consecutive even numbers is equal to 39 more than the odd number that lies between them. Find the even numbers.*

4. *The sum of three consecutive odd numbers is 27 more than the sum of even numbers that lie between them. Find the odd numbers.*

5. *A monkey ate 182 bananas in one week, eating 6 more bananas than on the previous day. How many bananas did the monkey eat on the first day?*

8.2 Maths challenge

Exercise 8.2.1

A farmer had N cows. In his will he decided to share his cows among his three sons. Each son would get one quarter of the cows. They couldn't kill or sell any. When the farmer died, the three brothers found it difficult to share the cows. An old man came by with a cow and the three brothers asked for help. The old man thought then said " I'll lend you my cow and then you'll be able to share the cows out." The three brothers then shared out the cows according to their fathers will and found that they had one cow left. So the brothers returned the old man's cow.

1. *How many cows did the farmer have?*

2. *How many did each person have?*

3. *If in the farmer's will, the eldest gets half, the middle child gets one third and the youngest gets one ninth, how many cows did the farmer have at least?*

4. *If in the farmer's will, the eldest gets one third, the middle child gets one third and the youngest gets one quarter, how many cows did the farmer have at least?*