

Year 7 Term 3 Homework

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

Table of contents

3	Year 7 Term 3 Week 3 Homework	1
3.1	Integers	1
3.1.1	The order of operations	1
3.2	Algebra	3
3.2.1	Substitution	3
3.2.2	Combine the like terms	3
3.2.3	Multiplication of algebraic terms	4
3.2.4	Division of algebraic terms	4
3.2.5	The distributive law	5
3.3	Maths Challenge	8
3.4	Miscellaneous Exercises	9

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3 Year 7 Term 3 Week 3 Homework

3.1 Integers

3.1.1 The order of operations

The order of operations states that:

- Expressions inside grouping symbols or with indices are worked first, then
- Multiplications and divisions are worked from left to right, then
- Additions and subtractions are worked from left to right.

Exercise 3.1.1 Use the order of operations and the rules for adjacent signs to evaluate each of these:

1. $-6 - 54 \div -6 - 9 =$ _____

2. $-35 \div 7 - 72 \div -8 =$ _____

3. $12 + 7 \times -3 - 5 \times 6 =$ _____

4. $-22 \div 11 - 40 \div 2 + 12 =$ _____

5. $12 \div 4 - 15 + 3 \times 5 =$ _____

Exercise 3.1.2 Evaluate the following:

1. $\frac{2 \times -6 \times 5}{3 \times -4}$

2. $\frac{-4 \times -3 \times -5}{-10 - 2}$

3. $\frac{-10 \times -3 \times -2}{-3 \times -5}$

Exercise 3.1.3 Further applications

1. 3 baseballs and 1 cricket ball weighed the same as 14 tennis balls. 1 baseball and 6 tennis balls have the same mass as 1 cricket ball. How many tennis balls weigh the same as 1 cricket ball?

2. At a bus stop 20 students were standing in four groups. The first group contained four students more than the second. The second group contained one student less than the third. The fourth group contained twice as many students as the second group. How many students were in each group?

3. For a parcel to be sent by air mail the cost is \$15 for the first 5 kg, plus \$5.80 for the next 5 kg, plus \$1.45 for each additional kg. What would be the cost of airmailing a parcel weighing 18 kg?

4. A man drove 18 km west, 30 km east then 9 km west. Where is he now in relation to his original position?

5. A woman stepped into an elevator on the third floor below ground level. The elevator went down 2 floors and then up 5 floors. Where is the elevator now relation to ground level?

3.2 Algebra

3.2.1 Substitution

Exercise 3.2.1 Evaluate each of the following when $a = 2$, $b = 4$ and $c = 6$.

1. $\frac{b+c}{a+b} =$ _____

2. $\frac{c-2}{b-a} =$ _____

3. $5a - 3c + 2b =$ _____

4. $\frac{2b+c}{b} =$ _____

5. $\frac{2a+2b}{c} =$ _____

6. $3a - 4b + 2c =$ _____

7. $(a + b)(c - a) =$ _____

8. $a^3b + c^2 =$ _____

3.2.2 Combine the like terms

To collect the like terms in an algebraic expression:

- add or subtract the co-efficients
- keep the same pronumeral(s).

Exercise 3.2.2 Simplify each of the following:

1. $9a - 6a + 4a + 8a =$ _____

2. $12b + 5b - 4b - 9b =$ _____

3. $2ab + 5ab + 9ab - 6ab =$ _____

4. $5m - 3m + 2n + 4m =$ _____

5. $3n^2 + 10n + 4n^2 - 9n =$ _____

6. $5u + 7uv - u + 6v - 3uv - 4v =$ _____

7. $15xy + 5yz - 6yx + 9 - 2zy - 1 =$ _____

8. $bc + c + ca + 7c + 4bc + 6ac =$ _____

3.2.3 Multiplication of algebraic terms**Exercise 3.2.3**

1. $3a \times (-2b) \times 8c =$ _____

2. $-2p \times 5q \times (-5r) =$ _____

3. $-4u \times (-3v) \times -6w =$ _____

4. $-6x \times 5y \times (-3z) =$ _____

5. $12p + 6p \times 4 + 2p =$ _____

6. $5e + 2e \times 4 + 14 - 3e =$ _____

7. $12 - 2m \times (-3n) - 9 =$ _____

8. $18u - u \times 5 + 7 \times 3 =$ _____

3.2.4 Division of algebraic terms**Exercise 3.2.4**

1. $8f + 54f \div 9 + 12f =$ _____

2. $9k - 64k^2 \div 4k - 3k =$ _____

3. $17 - 36m \div 12m \times 3 =$ _____

4. $10a + 15a \div 3 - 2a =$ _____

5. $-44gh^2 \div (-4gh) =$ _____

6. $28y^2 \div 36y =$ _____

7. $20x - 4x \div 4 - 6x =$ _____

8. $21k^2 \div 24k =$ _____

3.2.5 The distributive law

To expand an expression containing grouping symbols using the **Distributive Law**:

- Multiply the term outside the grouping symbols by each term inside.
- $a(b + c) = ab + ac$ and $a(b - c) = ab - ac$

Exercise 3.2.5 Expand and simplify the following:

1. $6a + 4(2a + 7) =$ _____

2. $12b + 2b(c - 6) =$ _____

3. $18b + 4b(2 - 2d) =$ _____

4. $7(a + 3) + 4(a + 1) =$ _____

5. $9(m + 10) + 8(2m - 5) =$ _____

6. $5(k + 12) + 2(6 - k) =$ _____

7. $4(7 - e) + 9(e - 6) =$ _____

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

Exercise 3.2.6 Write an algebraic expression for each of the following:1. *the quotient of x and y* _____2. *the product of 5, s and t* _____3. *three more than the product of two and y* _____4. *one-sixth of the number which is five less than p* _____5. *one-third of the number which is two more than q* _____6. *the sum of a and the square of b* _____7. *one-quarter of the difference between c and d* _____8. *one-tenth the quotient of m and n* _____

Exercise 3.2.7 Use grouping symbols to write an algebraic expression for each of the following:

1. the product of x and the number which is 8 less than y _____
2. five times the number which is 3 less than b _____
3. three times the difference between half of a and three quarters of b _____
4. the product of 8 and the difference between x and y _____
5. the product of d and the difference between e and one-third of f _____
6. 5 times 4 less than the cube of u _____

Exercise 3.2.8 Problem solving

1. How many drawing pins are needed to pin 12 paying cards to the wall if every corner of the paying card has a drawing pin?

2. A man bought an antique watch for \$800, then sold for \$1200. He then bought it back for \$1400, and sold it for \$1600. What profit or loss did he make?

3. Adam began with a whole number. He divided his original number by 2, subtracted 6 from the quotient, took the square root of difference, added 1 to the square root, and took the square root of the sum. His final result was 3. What was Adam's original number?

Exercise 3.2.9 Write an equation about the relationship between the given data and then solve the equation.

1. I think of a number. If I subtract 8 from 3 times my number, the result is 19. What is my number?

2. I think of a number. If I divide my number by 5, then subtract 11 from the quotient, the result is 8.

3. I think of a number. I add 28 to 4 times my number, then divide the sum by 4 I subtract my number from the quotient and the difference is 7. What is my number?

4. I think of a number. If I divide my number by 2, then add 9 to the quotient, the result is twice my number. What is the number.

5. One fifth of a barrel is 20 litres less than the capacity of the whole barrel. What is the capacity of the barrel?

Exercise 3.2.10 A natural number is 3 times another natural number.

1. If the smaller number is y , what is the greater number? _____
2. Write the sum of the two numbers. _____
3. Calculate the smaller number if the sum of the two numbers is 324. _____

3.3 Maths Challenge

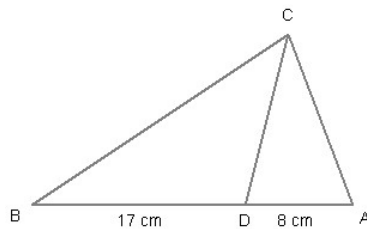
Exercise 3.3.1

1. A box of tacks has a mass of 120 grams when full and 70 grams when half full. What is the mass of the box when it is empty?

2. The product of two whole numbers is 48. The average of the two numbers is 8. Find the sum of these two numbers.

3. It is a fact that $1 + 2 + 3 + \dots + 48 + 49 + 50 = 1275$. What is the value of N , if $31 + 32 + 33 + 78 + 79 + 80 = N$?

4. The area of triangle ABC is 100 cm^2 . Point D lies on side BA , with $DA = 8 \text{ cm}$ and $BD = 17 \text{ cm}$. Find the area of triangle CBD in cm^2 .



3.4 Miscellaneous Exercises**Exercise 3.4.1 Solve the following equations:**

1. $2 \times a + a = \frac{21}{40}$

2. $b \times \frac{4}{9} = b - 1$

3. $(4 - c) \times 5 = 5 \times c - 20$

4. $7 \times (d - 2) = d - 2$

5. $6 \times e - 3 \times 3 = \frac{3}{8} + e \times 3$

6. $x - \frac{2}{5} = \frac{7}{10}$

7. $\frac{4}{5} + x = 2(x + 1)$

Exercise 3.4.2 Further applications

1. In one container there is twice as much water as there is in a second container. If we took 30 L of water out of the first container and 12 L of water out of the second container, both containers would hold the same amount of water. How much water is in each container?

2. Cathy said, " If I add a quarter of my number to my number I get $12\frac{1}{2}$ " What is Cathy's number?

3. 130% of a number is the same as adding 7.6 to 35% of the number. What is the number?

4. Linda has \$150 in her purse. This amount is \$60 less than one-sixth of all her money. How much money does Linda have?

5. I am thinking of a number. When I subtract 5 thirds of my number from the number itself, then add $-\frac{1}{2}$ to the difference, the result is $-1\frac{1}{6}$. What is my number?
