

Year 7 Term 3 Homework

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

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1 Year 7 Term 3 Week 1 Homework

1.1 Integers

1.1.1 Addition and subtraction involving directed numbers

Four basic types of additions and subtractions that can be performed with negative numbers:

- Starting on the negative side and going further away from zero. This is a subtraction.
- Starting on the positive side and going through zero to the negative side. This is a subtraction.
- Starting on the negative going toward zero but not reaching it. This is an addition.
- Starting on the negative side and going through zero to the positive side. This is an addition.

Note: In statement such $-5 - 3$, the first "-" is part of the number **negative five**. The second "-" is an operation. It means **subtract three**. When there are more than two terms involving addition and subtraction only, the order of operations is to work from left to right.

Example 1.1.1 Evaluate the following expressions:

1. $-3 + 5 - 7 = 2 - 7 = -5$
2. $2 - 3 + 6 = -1 + 6 = 5$

Exercise 1.1.1

1. $12 - 2 - 5 + 8 =$ _____
2. $-7 + 2 + 4 - 5 =$ _____
3. $-2 - 4 + (9 - 3) =$ _____

Exercise 1.1.2 Write the number that is:

1. 3 less than $-12 =$ _____
2. 12 less than 3 = _____
3. 6 more than $-15 =$ _____
4. Decrease -3 by 12 = _____
5. Increase -4 by 16 = _____
6. Take 5 from $-4 =$ _____
7. Add 8 to $-13 =$ _____
8. The sum of -5 and 12 = _____

Exercise 1.1.5 Further applications

1. By how much must -2 be increased to give 9?

2. By how much must -5 be decreased to give -13?

3. When 4 is subtracted from a number, the result is -23. What is the number?

4. When 10 is added to a number, the result is -13. What is the number?

5. What number when decreased by 7 gives -9?

6. What number when increased by 9 gives 6?

7. Find the sum of 8 and -3.

8. Difference between 4 and -9.

Exercise 1.1.6 Complete each of the following:

a. $2 \underline{\hspace{2cm}} + 6 = 2$

b. $-5 \underline{\hspace{2cm}} - 6 = -16$

c. $-7 \underline{\hspace{2cm}} - 3 = -2$

d. $\underline{\hspace{2cm}} - 4 + 2 = -7$

e. $\underline{\hspace{2cm}} + 3 - 9 = -5$

f. $-4 \underline{\hspace{2cm}} - 5 = 12$

1.1.3 Adjacent signs

Two like adjacent signs can be replaced with a single addition sign.

That is, $++$ or $--$ means $+$.

Two different adjacent signs can be replaced with a single subtraction sign.

That is, $+-$ or $-+$ means $-$.

Example 1.1.3 Evaluate the following:

a. $8 - -4 = 8 + 4 = 12$

b. $-5 + -3 = -5 - 3 = -8$

Exercise 1.1.7

a. $4 - (-2) =$ _____

b. $7 - (-12) =$ _____

c. $-3 - (+23) =$ _____

d. $10 + (-12) =$ _____

e. $-5 - -2 + -1 =$ _____

f. $-2 - (-6) + (-9) =$ _____

g. $1 - (-5) + (-16) =$ _____

h. $-7 + -7 - -7 =$ _____

Exercise 1.1.8

1. By how much does 7 exceed -4?

2. How much less than 7 is -9?

3. How much more than -2 is 6?

4. How much less than -6 is -15?

1.1.4 Multiplication involving directed numbers

The product of two numbers with like signs is positive.

That is, $(+) \times (+) = (+)$ and $(-) \times (-) = (+)$. The product of two numbers with different signs is negative.

That is, $(-) \times (+) = (-)$ and $(+) \times (-) = (-)$

Example 1.1.4

a. $-3 \times 4 \times -5 = 60$

b. $-2 \times -3 \times -4 = -24$

c. $(-5)^2 = 25$

d. $(-3)^3 = -27$

Exercise 1.1.9 Evaluate each of the following:

1. $3 \times 5 \times (-4) =$ _____

2. $-4 \times 5 \times 12 =$ _____

3. $7 \times (-2) \times (-6) =$ _____

4. $(-8) \times (-6) \times (-5) =$ _____

5. $5 \times (-3) \times 8 =$ _____

Exercise 1.1.10 Complete each of the following:

1. $5 \times$ _____ $= -60$

2. $-8 \times$ _____ $= 40$

3. $-9 \times 4 = 12 \times$ _____

4. $12 \times$ _____ $= -6 \times 10$

5. $25 \times$ _____ $= -15 \times -5$

Exercise 1.1.11 Evaluate each of these:

1. $(-10)^3 =$ _____

2. $(-3)^5 =$ _____

3. $(-2)^4 =$ _____

1.1.5 Division involving directed numbers

The quotient of two numbers with like signs is positive.

That is, $(+) \div (+) = (+)$ and $(-) \div (-) = (+)$.

The quotient of two numbers with different signs is negative.

That is, $(-) \div (+) = (-)$ and $(+) \div (-) = (-)$

In general, when dividing directed numbers:

- the quotient will be negative if there are an odd number of negative numbers.
- the quotient will be positive if there are an even number of negative numbers.

Example 1.1.5

1. $-30 \div 5 \div 2 = -3$

2. $-45 \div -5 \div -3 = -3$

3. $-90 \div 9 \div -2 = 5$

Exercise 1.1.12 Find the value of each of following expressions:

1. $60 \div -2 \div -3 =$ _____

2. $-24 \div 3 \div -4 =$ _____

3. $-60 \div (-2) \times (-7) =$ _____

4. $-28 \div (-7) \times 0 =$ _____

5. $-12 \div 4 \times 8 \div 2 =$ _____

6. $-80 \div (-4) \div (-2) =$ _____

Exercise 1.1.13 Complete each of the following:

a. $35 \div$ _____ $= -7$

b. _____ $\div -5 = -12$

c. $-49 \div$ _____ $= -7$

d. $108 \div$ _____ $\times 2 = -24$

e. $-72 \div -6 \div$ _____ $= -4$

f. $56 \div (-7) \times$ _____ $= 48$

1.1.6 Problem solving**Exercise 1.1.14**

1. The quotient of two integers is -8 . If one of the numbers is 8 , what are the possible values of the other number?

2. The average of three numbers is 12 . If two of the numbers are -8 and -3 , what is the third number?

3. If $6 \diamond 3$ means $(6 \div 3) - 5$, find the value of the these:

(a) $18 \diamond -3$

(b) $-42 \diamond -7$

(c) $-24 \diamond 8$

4. Given that $p = -6$, $q = 4$ and $r = -3$, evaluate each of these:

(a) $pq - 8r$

(b) $p^2 - q^2 + r^3$

(c) $(p + q)(p - q)$

1.2 Maths Challenge

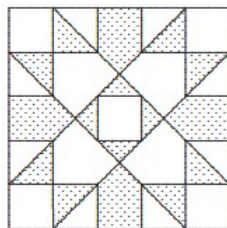
Exercise 1.2.1

1. David drove at an average speed of 84 km/h for 45 min. He then reduced his average speed by 8 km/h and drove a further 30 min before he reached his destination. Find the total distance covered by David.

2. What is the smallest, positive, whole number which gives:

1. a remainder of 1 when it is divided by 3.
2. a remainder of 2 when it is divided by 4.
3. a remainder of 3 when it is divided by 5.
4. a remainder of 4 when it is divided by 6.

3. The traditional patchwork motif is composed of squares and right-angled isosceles triangles. What part of the area of the whole square is shaded?



4. In lowest terms, how much larger is $\frac{2010}{25} + 25$ than $\frac{2010+25}{25}$?

5. If $\frac{1}{x} + \frac{1}{y} = 2$, what is the value of xy ?

6. How many shapes 4 cm long, 4 cm wide and 2 cm high will fit in a box which measures 16 cm long, 12 cm wide and 4 cm high?

7. If 5 days after the day before yesterday is Sunday, what day of the week is tomorrow?

8. What is the value of $13 \times 17 + 61 \times 13 + 22 \times 13$?

9. A van and a truck were travelling from Town A to Town B which 600 km apart. The truck set off one hour earlier than the van but arrived two hours later. If the average speed of the van was 100 km/h, find the average speed of the truck.

1.3 Miscellaneous Exercises

Exercise 1.3.1

1. If a rectangle has a perimeter of 64 cm and one side is three times as long as another, what is the area of the rectangle?

2. In $248 \times 25 = 250 \times 25 - \square \times 25$. Find the missing number in the box.

3. Emma gave $\frac{3}{5}$ of her marbles to Alice and had 218 marbles left. How many marbles did she have at first?

4. In a box, $\frac{1}{6}$ of the marbles are red and $\frac{1}{2}$ of them are white. The remaining 180 marbles are blue. How many marbles are in the box?

5. The perimeter of a rectangular garden is 240 m. Its length is 12 m longer than its breadth. Find the cost of turfing it with synthetic grass at $\$3.50/\text{m}^2$.

Exercise 1.3.2

1. Janet spent \$24 on fruits, \$36 on stationery and had \$48 left. What fraction of her money did she spend on fruits?

2. William added 60 to a number. He then divided the result by 3. The answer was 60. Find the number.

3. Study the number pattern shown below carefully. What is the value of A?

30	36	45	A	72	90
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4. Ken and his five friends went out for dinner. They spent \$242 on food and \$52 on drinks. Ken paid \$68 while the rest of the bill was shared equally among the five friends. How much more than each of his five friends did Ken pay?

5. The sum of 2 numbers is 54. When the bigger number is divided by the smaller, the answer is 9 with a remainder of 4. Find the two numbers.
