



Grade 7 Mathematics

Unit 1: Number System

Study Guide

Name: _____

Section: _____

Unit 1 Learning Objectives

Math Concept	I Can Statement
Number Sets	I can classify numbers as natural, whole, integer, and rational, and compare their values.
Rounding & Place Value	I can round whole numbers and decimals to a required place value.
Integers, Opposites & Absolute Value	I can represent and order integers, identify opposites, and interpret absolute value as distance from zero.
Adding & Subtracting Integers	I can add and subtract integers using models, number lines, and rules.
Adding & Subtracting Rational Numbers	I can add and subtract fractions, mixed numbers, and decimals.
Properties of Operations	I can identify and use the commutative, associative, identity, inverse, zero, and distributive properties where appropriate.
Multiplying & Dividing Integers	I can multiply and divide integers and determine the sign of an answer.
Fraction Skills	I can simplify fractions and convert between mixed numbers and improper fractions.
Multiplying & Dividing Rational Numbers	I can multiply and divide rational numbers, including fractions, mixed numbers, and decimals.
Division by Zero	I can explain why division by zero is undefined.
Fractions & Decimals	I can convert between fractions and decimals, identify terminating and repeating decimals, and convert repeating decimals to fractions using algebraic subtraction.
Squares, Cubes & Negative Bases	I can evaluate perfect squares, perfect cubes, and powers involving negative numbers.
Long Division with Decimals	I can divide decimals using long division and correctly shift decimal points.

1. Number Classification

Classify each number using the **smallest set possible**.

N = Natural

W = Whole

Z = Integer

Q = Rational

a) 7

i) -1.75

b) 0

j) $\frac{12}{3}$

c) -12

k) -0.4

d) $\frac{3}{4}$

l) $\frac{9}{4}$

e) 2.5

m) 6.0

f) -8

n) $0.\overline{3}$

g) $-\frac{5}{2}$

o) $-\frac{21}{7}$

h) 100

p) $1\frac{1}{2}$

Order each set from least to greatest.

a) $-3, 5, -1, 0$

d) $-7, \frac{3}{4}, 1, -2$

b) $\frac{1}{2}, -4, 2, -1$

e) $-8, 4, \frac{3}{4}, -3, 0, 4.6$

c) $-2.4, 0, 3, -5$

f) $2.5, -1.2, 0, -\frac{1}{2}, 3$



2. Rounding & Place Value

Identify the place being rounded, then look at the digit immediately to its right. Digits 0–4 keep the rounding digit the same; digits 5–9 increase it by 1.

A. Round each number to the indicated place value.

- | | |
|------------------------------------|---------------------------------------|
| a) 9.764 to the nearest tenth | e) 2.68749 to the nearest tenth |
| b) 6.4837 to the nearest hundredth | f) 53.07481 to the nearest thousandth |
| c) 0.4587 to the nearest hundredth | g) 0.013672 to the nearest thousandth |
| d) 3.2193 to the nearest hundredth | h) 120.77348 to the nearest tenth |

B. Round to the indicated place value.

- | | |
|----------------------------|--------------------------------|
| a) 78 to the nearest 10 | e) 8435 to the nearest 1000 |
| b) 213 to the nearest 10 | f) 12 764 to the nearest 1000 |
| c) 628 to the nearest 100 | g) 155 678 to the nearest 1000 |
| d) 4396 to the nearest 100 | h) 403 219 to the nearest 1000 |



3. Integers, Opposites & Number Lines

A. Find the opposite of each number.

a) -8

d) 3.5

b) 12

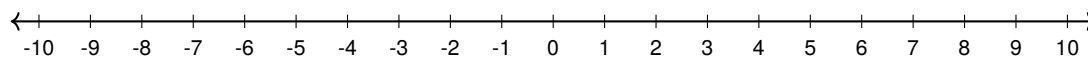
e) $-\frac{2}{5}$

c) -25

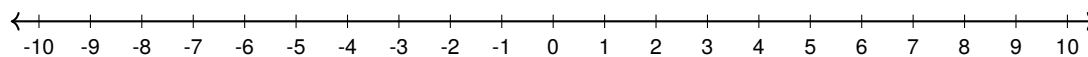
f) 0

B. Plot each integer on the number line and state its opposite.

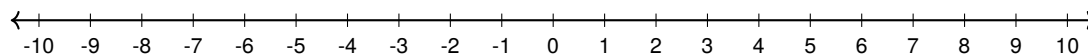
a) Plot -7 . Opposite: _____



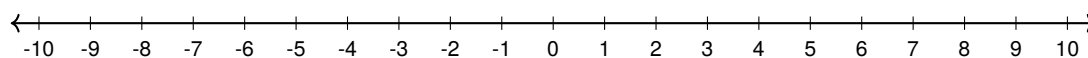
b) Plot 4 . Opposite: _____



c) Plot -9 . Opposite: _____



d) Plot 6 . Opposite: _____



4. Integer Tiles

Draw integer tiles for each integer.

a) $+4$

d) -6

b) -3

e) $+2$

c) $+7$

f) -8

Use integer tiles to model each expression.

a) $(+3) + (-7)$

d) $(-2) - (-5)$

b) $(-5) + (+8)$

e) $(+6) + (-6)$

c) $(+4) - (+6)$

f) $(-4) + (+1)$



5. Adding Integers

Evaluate.

a) $(+4) + (+7)$

f) $(+14) + (-6)$

b) $(-5) + (-6)$

g) $(-9) + (+20)$

c) $(-8) + (+13)$

h) $(-11) + (-7)$

d) $(+12) + (-17)$

i) $(+18) + (-30)$

e) $(-25) + (+9)$

j) $(-16) + (+16)$

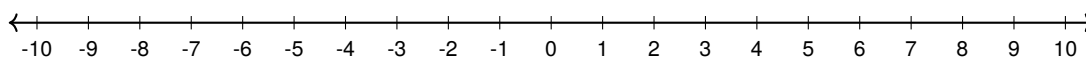


5. Adding Integers on a Number Line

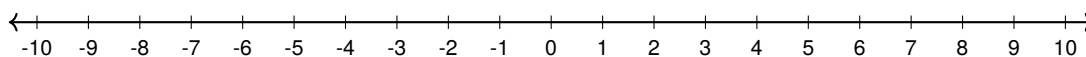
Start at the first integer. A positive addend moves right; a negative addend moves left. Mark the final position clearly.

Evaluate each expression and illustrate the movement on the number line.

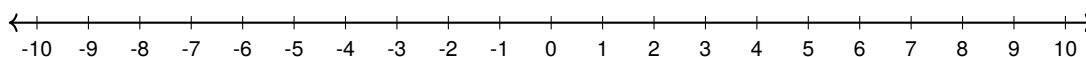
a) $(+6) + (-9)$



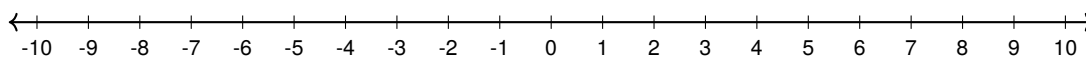
b) $(-4) + (+7)$



c) $(-8) + (+3)$



d) $(+5) + (-12)$



6. Subtracting Integers

Rewrite using addition, then evaluate.

a) $(+5) - (+8)$

f) $(-15) - (+6)$

b) $(-4) - (+7)$

g) $(-9) - (-12)$

c) $(+3) - (-9)$

h) $(+7) - (+13)$

d) $(-8) - (-5)$

i) $(-20) - (-8)$

e) $(+12) - (-4)$

j) $(+4) - (-11)$

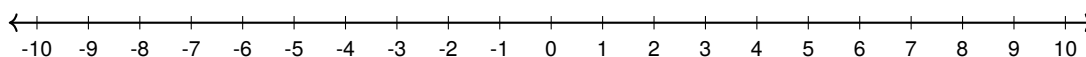


6. Subtracting Integers on a Number Line

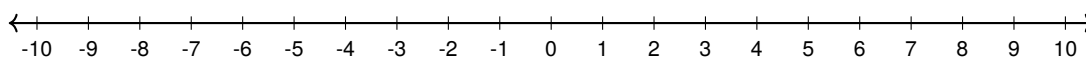
Rewrite subtraction as adding the opposite first. Then model the equivalent addition on the number line.

Rewrite, evaluate, and show the movement on the number line.

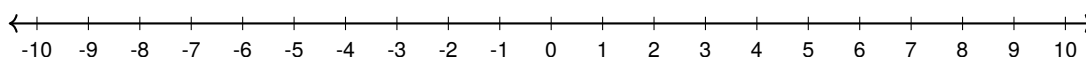
a) $(+7) - (+11)$



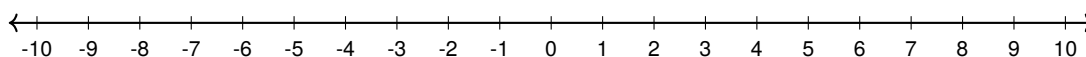
b) $(-3) - (-8)$



c) $(-6) - (+5)$



d) Start at -4 , move -3 , then move $+8$. Mark the final position and write the integer.



7. Adding Rational Numbers

Evaluate. Simplify each answer when possible.

a) $\frac{1}{2} + \frac{1}{4}$

h) $-\frac{5}{6} + 1\frac{1}{3}$

b) $\frac{3}{4} + \frac{2}{3}$

i) $\frac{7}{12} + \frac{5}{18}$

c) $-\frac{1}{2} + \frac{3}{4}$

j) $-3.25 + \frac{7}{4}$

d) $1.5 + (-2.8)$

k) $-2\frac{3}{4} + 1\frac{5}{8}$

e) $-3.7 + 4.2$

l) $\frac{2}{3} + \frac{1}{2} - \frac{5}{6}$

f) $1\frac{1}{2} + 2\frac{3}{4}$

m) $-1.4 + 3.6$

g) $-2\frac{1}{4} + 4\frac{1}{2}$



8. Subtracting Rational Numbers

Evaluate. Simplify each answer when possible.

a) $\frac{5}{6} - \frac{1}{3}$

h) $\frac{5}{8} - \frac{3}{10}$

b) $\frac{7}{8} - \frac{1}{4}$

i) $4\frac{1}{2} - 2\frac{5}{6}$

c) $-\frac{3}{4} - \frac{1}{2}$

j) $-1.4 - 3.6$

d) $3.8 - 1.5$

k) $-3.25 - \frac{7}{4}$

e) $2.7 - (-1.9)$

l) $2\frac{1}{3} - 5\frac{1}{6}$

f) $5\frac{1}{2} - 2\frac{1}{4}$

m) $0.75 - (-2.5)$

g) $3\frac{3}{4} - 5\frac{1}{2}$



9. Properties of Addition & Subtraction

Name the property illustrated.

a) $(4 + 7) + 3 = 4 + (7 + 3)$

e) $-9 + 9 = 0$

b) $5 + 0 = 5$

f) $3.5 + (-3.5) = 0$

c) $8 + 2 = 2 + 8$

g) $(-4 + 6) + 2 = -4 + (6 + 2)$

d) $12 + 0 = 12$

h) $\frac{1}{2} + \frac{3}{4} = \frac{3}{4} + \frac{1}{2}$



10. Multiplying Integers

Evaluate.

a) $(+4)(+5)$

h) $(-5)(2)(-4)$

b) $(-4)(+5)$

i) $(+7)(-8)$

c) $(+6)(-7)$

j) $(-11)(3)$

d) $(-8)(-3)$

k) $(-10)(-10)$

e) $(-12)(5)$

l) $(-2)(5)(-3)$

f) $(-9)(-6)$

m) $(-4)(-4)(-2)$

g) $(-2)(-3)(4)$

n) $(+12)(-9)$



11. Dividing Integers

Evaluate.

a) $24 \div 6$

h) $108 \div (-9)$

b) $-24 \div 6$

i) $-63 \div 7$

c) $24 \div (-6)$

j) $144 \div (-12)$

d) $-24 \div (-6)$

k) $-121 \div (-11)$

e) $72 \div (-8)$

l) $225 \div (-15)$

f) $-84 \div (-12)$

m) $(-48) \div (-6)$

g) $-96 \div 8$

n) $(-98) \div 7$



12. Simplifying Fractions

Simplify each fraction to lowest terms.

a) $\frac{6}{8}$

g) $\frac{63}{81}$

m) $\frac{18}{42}$

b) $\frac{15}{20}$

h) $\frac{72}{96}$

n) $\frac{56}{84}$

c) $\frac{21}{28}$

i) $\frac{14}{35}$

o) $\frac{44}{55}$

d) $\frac{36}{54}$

j) $\frac{32}{40}$

p) $\frac{45}{63}$

e) $\frac{48}{60}$

k) $\frac{27}{45}$

q) $\frac{12}{18}$

f) $\frac{24}{36}$

l) $\frac{50}{75}$

r) $\frac{35}{63}$



13. Mixed Numbers & Improper Fractions

Mixed to Improper

a) $2\frac{1}{3}$

b) $4\frac{2}{5}$

c) $5\frac{3}{4}$

d) $3\frac{7}{8}$

e) $-2\frac{1}{4}$

f) $6\frac{3}{8}$

g) $-1\frac{5}{6}$

Improper to Mixed

a) $\frac{11}{3}$

b) $\frac{17}{4}$

c) $\frac{23}{5}$

d) $\frac{29}{6}$

e) $-\frac{35}{12}$

f) $\frac{41}{8}$

g) $-\frac{29}{9}$



14. Multiplying Rational Numbers

Evaluate. Simplify each answer when possible.

a) $\frac{3}{4} \times \frac{2}{5}$

h) $2\frac{1}{2} \times 1\frac{1}{3}$

b) $\frac{5}{6} \times \frac{1}{3}$

i) $\frac{7}{8} \times \frac{4}{7}$

c) $-\frac{2}{3} \times \frac{9}{4}$

j) -3.2×0.4

d) $-\frac{5}{7} \times -\frac{14}{15}$

k) $-\frac{3}{5} \times 2$

e) 1.2×0.5

l) $1\frac{1}{4} \times 3$

f) -2.4×0.3

m) $-\frac{5}{6} \times -\frac{12}{25}$

g) $-1.5 \times (-4)$

n) $0.75 \times (-8)$



15. Dividing Rational Numbers

Evaluate. Simplify each answer when possible.

a) $\frac{3}{4} \div \frac{2}{5}$

h) $2\frac{1}{4} \div \frac{3}{4}$

b) $\frac{5}{6} \div \frac{1}{3}$

i) $\frac{8}{9} \div \frac{2}{3}$

c) $-\frac{2}{3} \div \frac{4}{9}$

j) $5.6 \div 0.7$

d) $-\frac{5}{7} \div -\frac{10}{21}$

k) $-\frac{3}{4} \div 3$

e) $2.4 \div 0.6$

l) $1.8 \div (-0.2)$

f) $-3.6 \div 1.2$

m) $3\frac{1}{2} \div \frac{1}{2}$

g) $-4.5 \div (-0.5)$

n) $-\frac{5}{7} \div 5$



16. Division by Zero

Determine whether each expression is defined or undefined.

a) $8 \div 0$

e) $-5 \div 0$

b) $0 \div 8$

f) $0 \div (-5)$

c) $12 \div 0$

g) $100 \div 0$

d) $0 \div 12$

h) $0 \div 100$

Explain why division by zero is undefined.



17. Properties of Multiplication & Division

Name the property illustrated.

a) $6 \times 1 = 6$

e) $9 \cdot 4 = 4 \cdot 9$

b) $7 \times 0 = 0$

f) $4(x + 6) = 4x + 24$

c) $3(5 + 2) = 3(5) + 3(2)$

g) $1 \cdot 18 = 18$

d) $(2 \cdot 5) \cdot 4 = 2 \cdot (5 \cdot 4)$

h) $0 \cdot (-7) = 0$

Multiplication is commutative and associative. Division is **not** commutative and is **not** associative.



18. Fractions to Decimals

Convert each fraction to a decimal.

a) $\frac{1}{2}$

g) $\frac{5}{6}$

b) $\frac{1}{4}$

h) $\frac{2}{3}$

c) $\frac{3}{4}$

i) $\frac{7}{8}$

d) $\frac{3}{8}$

j) $\frac{9}{20}$

e) $\frac{1}{5}$

k) $\frac{7}{25}$

f) $\frac{2}{5}$

l) $\frac{11}{50}$

State whether each decimal is terminating or repeating.

a) $\frac{3}{8}$

d) $\frac{2}{3}$

b) $\frac{5}{6}$

e) $\frac{7}{25}$

c) $\frac{1}{4}$

f) $\frac{7}{9}$



19. Decimals to Fractions

Convert each decimal to a fraction in simplest form.

a) 0.5

g) 2.6

b) 0.25

h) 0.875

c) 0.75

i) 0.125

d) 0.2

j) 0.04

e) 0.45

k) 3.75

f) 1.25

l) 1.6



20. Repeating Decimals to Fractions

Convert each repeating decimal to a fraction in simplest form. Show the algebraic subtraction.

a) $0.\overline{3}$

e) $0.\overline{27}$

b) $0.\overline{6}$

f) $0.\overline{45}$

c) $0.\overline{8}$

g) $0.\overline{72}$

d) $0.\overline{1}$

h) $0.\overline{12}$

$$\begin{aligned}x &= 0.\overline{3} \\10x &= 3.\overline{3} \\10x - x &= 3 \\9x &= 3 \\x &= \frac{1}{3}\end{aligned}$$



21. Perfect Squares & Perfect Cubes

Evaluate.

a) 2^2

g) 2^3

b) 5^2

h) 3^3

c) 10^2

i) 5^3

d) 12^2

j) 7^3

e) 15^2

k) 10^3

f) 20^2

l) 4^3



22. Negative Numbers Raised to Powers

In $(-3)^2$, the negative is part of the base. In -3^2 , the exponent applies to 3 first and the negative sign is applied afterward.

Evaluate.

a) $(-2)^2$

g) $(-5)^2$

b) -2^2

h) -5^2

c) $(-3)^2$

i) $(-2)^4$

d) -3^2

j) -2^4

e) $(-4)^3$

k) $(-1)^5$

f) -4^3

l) $(-1)^6$



23. Absolute Value

Absolute value is the distance a number is from 0 on the number line. Distance is never negative.

Evaluate.

a) $|-8|$

e) $|5 - 12|$

b) $|12|$

f) $|-9 + 14|$

c) $|-15|$

g) $|7 - (-15)|$

d) $|-7 + 3|$

h) $|-4 - 9|$

Apply absolute value in context.

a) A submarine is 250 m below sea level. What is its distance from sea level?

b) The temperature is -18°C . What is its distance from 0°C ?



24. Long Division with Decimals

If the divisor is a decimal, move its decimal point until it becomes a whole number. Move the decimal point in the dividend the same number of places before dividing.

Use long division. Show your setup and working.

a) $4.8 \div 0.6$

e) $6.25 \div 0.25$

b) $8.4 \div 0.2$

f) $9.6 \div 1.2$

c) $12.6 \div 3$

g) $5.64 \div 0.06$

d) $3.75 \div 1.5$

h) $24.6 \div 1.2$



25. Error Analysis

For each problem, **identify the mistake**, **explain why it is incorrect**, and **solve correctly**.

1. Integer subtraction

$$(-5) - (-2) = -7$$

2. Adding fractions

$$\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$$

3. Multiplying integers

$$(-4)(-3) = -12$$

4. Negative base and exponent

$$-3^2 = 9$$



Grade 7 Mathematics
Unit 1: Number System
Answer Key

1. Number Classification

Smallest set possible

- a) 7 : N

b) 0 : W

c) -12 : Z

d) $\frac{3}{4}$: Q

e) 2.5 : Q

f) -8 : Z
- g) $-\frac{5}{2}$: Q

h) 100 : N

i) -1.75 : Q

j) $\frac{12}{3} = 4$: N

k) -0.4 : Q

l) $\frac{9}{4}$: Q
- m) $6.0 = 6$: N

n) $0.\overline{3}$: Q

o) $-\frac{21}{7} = -3$: Z

p) $1\frac{1}{2}$: Q

Least to greatest

- a) $-3, -1, 0, 5$

b) $-4, -1, \frac{1}{2}, 2$

c) $-5, -2.4, 0, 3$
- d) $-7, -2, \frac{3}{4}, 1$

e) $-8, -3, 0, \frac{3}{4}, 4, 4.6$

f) $-1.2, -\frac{1}{2}, 0, 2.5, 3$

2. Rounding & Place Value

A. Tenths, hundredths & thousandths

- a) 9.8

b) 6.48

c) 0.46

d) 3.22
- e) 2.7

f) 53.075

g) 0.014

h) 120.8

B. Tens, hundreds & thousands

- a) 80

b) 210

c) 600

d) 4400
- e) 8000

f) 13 000

g) 156 000

h) 403 000

3. Integers, Opposites & Number Lines

A. Opposites

- a) 8

b) -12
- c) 25

d) -3.5
- e) $\frac{2}{5}$

f) 0

B. Number lines

- a) Plot -7 ; opposite = 7

b) Plot 4; opposite = -4
- c) Plot -9 ; opposite = 9

d) Plot 6; opposite = -6

4. Integer Tiles

Represent each integer

- a) 4 positive tiles

b) 3 negative tiles

c) 7 positive tiles
- d) 6 negative tiles

e) 2 positive tiles

f) 8 negative tiles

Models

- a) -4

b) 3
- c) -2

d) 3
- e) 0

f) -3

5. Adding Integers

- a) 11

b) -11

c) 5

d) -5
- e) -16

f) 8

g) 11

h) -18
- i) -12

j) 0

Number-line questions

- a) -3

b) 3
- c) -5

d) -7



6. Subtracting Integers

- a) $5 + (-8) = -3$
 b) $-4 + (-7) = -11$
 c) $3 + 9 = 12$
 d) $-8 + 5 = -3$
 e) $12 + 4 = 16$

- f) $-15 + (-6) = -21$
 g) $-9 + 12 = 3$
 h) $7 + (-13) = -6$
 i) $-20 + 8 = -12$
 j) $4 + 11 = 15$

Number-line questions

- a) $7 + (-11) = -4$
 b) $-3 + 8 = 5$

- c) $-6 + (-5) = -11$
 d) $-4 + (-3) + 8 = 1$

7. Adding Rational Numbers

- a) $\frac{3}{4}$
 b) $\frac{17}{12} = 1\frac{5}{12}$
 c) $\frac{1}{4}$
 d) -1.3
 e) 0.5

- f) $4\frac{1}{4}$
 g) $2\frac{1}{4}$
 h) $\frac{1}{2}$
 i) $\frac{31}{36}$

- j) $-1\frac{1}{2}$
 k) $-1\frac{1}{8}$
 l) $\frac{1}{3}$
 m) 2.2

8. Subtracting Rational Numbers

- a) $\frac{1}{2}$
 b) $\frac{5}{8}$
 c) $-\frac{5}{4} = -1\frac{1}{4}$
 d) 2.3

- e) 4.6
 f) $3\frac{1}{4}$
 g) $-1\frac{3}{4}$
 h) $\frac{13}{40}$

- i) $1\frac{2}{3}$
 j) -5
 k) -5
 l) $-2\frac{5}{6}$
 m) $3\frac{1}{4}$

9. Properties of Addition & Subtraction

- a) Associative Property
 b) Additive Identity Property
 c) Commutative Property
 d) Additive Identity Property

- e) Additive Inverse Property
 f) Additive Inverse Property
 g) Associative Property
 h) Commutative Property

10. Multiplying Integers

- a) 20
 b) -20
 c) -42
 d) 24

- e) -60
 f) 54
 g) 24
 h) 40

- i) -56
 j) -33
 k) 100
 l) 30

- m) -32
 n) -108

11. Dividing Integers

- a) 4
 b) -4
 c) -4
 d) 4

- e) -9
 f) 7
 g) -12
 h) -12

- i) -9
 j) -12
 k) 11
 l) -15

- m) 8
 n) -14

12. Simplifying Fractions

- a) $\frac{3}{4}$
 b) $\frac{3}{4}$
 c) $\frac{3}{4}$
 d) $\frac{2}{3}$
 e) $\frac{4}{5}$

- f) $\frac{2}{3}$
 g) $\frac{7}{9}$
 h) $\frac{3}{4}$
 i) $\frac{2}{5}$
 j) $\frac{4}{5}$

- k) $\frac{3}{5}$
 l) $\frac{2}{3}$
 m) $\frac{3}{7}$
 n) $\frac{2}{3}$
 o) $\frac{4}{5}$

- p) $\frac{5}{9}$
 q) $\frac{2}{3}$
 r) $\frac{5}{9}$



13. Mixed Numbers & Improper Fractions

Mixed to Improper

- | | | |
|-------------------|-------------------|--------------------|
| a) $\frac{7}{3}$ | d) $\frac{31}{8}$ | g) $-\frac{11}{6}$ |
| b) $\frac{22}{5}$ | e) $-\frac{9}{4}$ | |
| c) $\frac{23}{4}$ | f) $\frac{51}{8}$ | |

Improper to Mixed

- | | | |
|-------------------|----------------------|--------------------|
| a) $3\frac{2}{3}$ | d) $4\frac{5}{6}$ | g) $-3\frac{2}{9}$ |
| b) $4\frac{1}{4}$ | e) $-2\frac{11}{12}$ | |
| c) $4\frac{3}{5}$ | f) $5\frac{1}{8}$ | |

14. Multiplying Rational Numbers

- | | | |
|-----------------------------------|----------------------------------|-----------------------------------|
| a) $\frac{3}{10}$ | e) 0.6 | j) -1.28 |
| b) $\frac{5}{18}$ | f) -0.72 | k) $-\frac{6}{5} = -1\frac{1}{5}$ |
| c) $-\frac{3}{2} = -1\frac{1}{2}$ | g) 6 | l) $\frac{15}{4} = 3\frac{3}{4}$ |
| d) $\frac{2}{3}$ | h) $\frac{10}{3} = 3\frac{1}{3}$ | m) $\frac{2}{5}$ |
| | i) $\frac{1}{2}$ | n) -6 |

15. Dividing Rational Numbers

- | | | |
|-----------------------------------|---------------------------------|-------------------|
| a) $\frac{15}{8} = 1\frac{7}{8}$ | e) 4 | j) 8 |
| b) $\frac{5}{2} = 2\frac{1}{2}$ | f) -3 | k) $-\frac{1}{4}$ |
| c) $-\frac{3}{2} = -1\frac{1}{2}$ | g) 9 | l) -9 |
| d) $\frac{3}{2} = 1\frac{1}{2}$ | h) 3 | m) 7 |
| | i) $\frac{4}{3} = 1\frac{1}{3}$ | n) $-\frac{1}{7}$ |

16. Division by Zero

- | | | | |
|--------------|--------------|--------------|--------------|
| a) Undefined | c) Undefined | e) Undefined | g) Undefined |
| b) 0 | d) 0 | f) 0 | h) 0 |

Explanation: Division asks what number multiplied by the divisor gives the dividend. No number multiplied by 0 can produce a nonzero number, so division by zero is undefined.

17. Properties of Multiplication & Division

- | | |
|-------------------------------------|-------------------------------------|
| a) Multiplicative Identity Property | e) Commutative Property |
| b) Zero Property of Multiplication | f) Distributive Property |
| c) Distributive Property | g) Multiplicative Identity Property |
| d) Associative Property | h) Zero Property of Multiplication |

18. Fractions to Decimals

Convert to a decimal

- | | | | |
|---------|----------|-----------------|---------|
| a) 0.5 | d) 0.375 | g) $0.8\bar{3}$ | j) 0.45 |
| b) 0.25 | e) 0.2 | h) 0.6 | k) 0.28 |
| c) 0.75 | f) 0.4 | i) 0.875 | l) 0.22 |

Terminating or repeating

- | | | |
|----------------|----------------|----------------|
| a) Terminating | c) Terminating | e) Terminating |
| b) Repeating | d) Repeating | f) Repeating |

19. Decimals to Fractions

- | | | | |
|------------------|-------------------|-------------------|-------------------|
| a) $\frac{1}{2}$ | d) $\frac{1}{5}$ | g) $\frac{13}{5}$ | j) $\frac{1}{25}$ |
| b) $\frac{1}{4}$ | e) $\frac{9}{20}$ | h) $\frac{7}{8}$ | k) $\frac{15}{4}$ |
| c) $\frac{3}{4}$ | f) $\frac{5}{4}$ | i) $\frac{1}{8}$ | l) $\frac{8}{5}$ |



20. Repeating Decimals to Fractions

$x = 0.\overline{3}$ $10x = 3.\overline{3}$ a) $9x = 3$ $x = \frac{1}{3}$ $x = 0.\overline{6}$ $10x = 6.\overline{6}$ b) $9x = 6$ $x = \frac{2}{3}$ $x = 0.\overline{8}$ $10x = 8.\overline{8}$ c) $9x = 8$ $x = \frac{8}{9}$ $x = 0.\overline{1}$ $10x = 1.\overline{1}$ d) $9x = 1$ $x = \frac{1}{9}$	$x = 0.\overline{27}$ $100x = 27.\overline{27}$ e) $99x = 27$ $x = \frac{3}{11}$ $x = 0.\overline{45}$ $100x = 45.\overline{45}$ f) $99x = 45$ $x = \frac{5}{11}$ $x = 0.\overline{72}$ $100x = 72.\overline{72}$ g) $99x = 72$ $x = \frac{8}{11}$ $x = 0.\overline{12}$ $100x = 12.\overline{12}$ h) $99x = 12$ $x = \frac{4}{33}$
--	--

21. Perfect Squares & Perfect Cubes

a) 4	d) 144	g) 8	j) 343
b) 25	e) 225	h) 27	k) 1000
c) 100	f) 400	i) 125	l) 64

22. Negative Numbers Raised to Powers

a) 4	d) -9	g) 25	j) -16
b) -4	e) -64	h) -25	k) -1
c) 9	f) -64	i) 16	l) 1

23. Absolute Value

a) 8	c) 15	e) 7	g) 22
b) 12	d) 4	f) 5	h) 13

Context

a) 250 m	b) 18°C
-----------------	----------------

24. Long Division with Decimals

a) 8	c) 4.2	e) 25	g) 94
b) 42	d) 2.5	f) 8	h) 20.5

| 25. Error Analysis

1. Integer subtraction

The subtraction of a negative must be rewritten as addition of the opposite:

$$(-5) - (-2) = (-5) + 2 = \boxed{-3}$$

2. Adding fractions

The numerators and denominators cannot both be added. Use a common denominator:

$$\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \boxed{\frac{5}{6}}$$

3. Multiplying integers

The product of two negative numbers is positive:

$$(-4)(-3) = \boxed{12}$$

4. Negative base and exponent

Without parentheses, the exponent applies only to the 3:

$$-3^2 = -(3^2) = \boxed{-9}$$

