King School

Math Review Summer Assignment

For Students Entering MAT 702

2021-2022

Each section has an "In a Nutshell" review followed by practice problems.
-Please read through the review first, then complete the problems listed.

-All work should be done on a separate sheet of paper in order.

-Each problem should be clearly labeled with the page number and problem number.

-Every answer should be circled.

-No final answers without supporting work will be accepted. ANY SUMMER ASSIGNMENT SUBMITED WITHOUT SUFFICIENT ACCOMPANYING WORK WILL NOT BE ACCEPTED AND WILL REQUIRE YOU TO REDO THE ENTIRE ASSIGNMENT.

-Please be sure to use notes from the previous year as well as educational resources on the Internet such as Kahn Academy to refresh your memory if need be.

-Working with a tutor on these exact problems is not permitted.

-**Calculators and Photomath** are not permitted.

-This assignment will be handed in the first day of class and will count towards **your first graded assignment.**

-You will submit all of the pages with your work, but you do not need to submit this packet.

Chapter	Section	Page	Questions
1	1.1	p.10	#1-3 All
	1.2	Further practice	#3
	1.4	p.32	#2
2	2.1	p.48	#2, 5, 6, 7
	2.2	p.63	#2, 9, 10
3	3.1	p.77	#6
	3.3	p.94	#4, 5, 9
	3.4	p.99	#1, 2
4	4.1	p.118	#2
		p.119	#6
	4.2	p.126	#2, 3
Ch.7	7.1	p.197	#1, 2
	7.2	p.206	#2
Ch.8	8.1	p.17	#6, 7
	8.2	p.24	#1, 2, 3
Ch.9	9.1	p.42	#2, 5
	9.2	p.49	#1, 2, 3

IN A NUTSHELL

Factors and Multiples

In $4 \times 3 = 12$,

- 4 and 3 are factors of 12.
- 12 is a multiple of both 4 and 3.
- The smallest common multiple of two or more numbers is called the **least common multiple (LCM)**.
- The largest common factor of two or more numbers is called the **greatest common factor (GCF)**.

Exponents

5^3 ← exponent

base

$5^3 = 5 \times 5 \times 5$

Order of Operations for Evaluating Expressions

- In general, calculate from left to right.
- Evaluate the expression within the innermost pair of parentheses first if there is more than one pair of parentheses.
- Evaluate the exponents next.
- Do multiplication and division before addition and subtraction.

Properties of Multiplication

- **Commutative Property of Multiplication**
  $a \times b = b \times a$
  For example: $5 \times 4 = 4 \times 5$.
- **Identity Property of Multiplication**
  $a \times 1 = a$
- **Zero Property of Multiplication**
  $a \times 0 = 0$
- **Associative Property of Multiplication**
  $(a \times b) \times c = a \times (b \times c)$
  For example: $(2 \times 3) \times 4 = 2 \times (3 \times 4)$.
- **Distributive Property of Multiplication**
  $a \times (b + c) = a \times b + a \times c$
  For example: $5 \times (3 + 2) = 5 \times 3 + 5 \times 2$,
  $(6 - 4) \times 8 = 6 \times 8 - 4 \times 8$.

Properties of Division

- **Identity Property of Division**
  $a \div 1 = a$
- **Zero Property of Division**
  $0 \div a = 0$, where $a \neq 0$
- We can divide the sum of, or the difference between, two numbers in parentheses by dividing each number in the parentheses.
  For example: $(8 + 4) \div 2 = 8 \div 2 + 4 \div 2$,
  $(20 - 10) \div 5 = 20 \div 5 - 10 \div 5$.
- When we multiply or divide both the dividend and the divisor by the same number, the quotient remains the same.
  For example: $24 \div 8 = (24 \div 4) \div (8 \div 4)$,
  $6 \div 2 = (6 \times 3) \div (2 \times 3)$.

Example 9

Evaluate the following expressions.

(a) $4^2 \div (12 - 8)$

(b) $25 - (2 + 6 \times 3)$

(c) $27 \div 3^2 + (20 - 2^3)$

(d) $((44 - 2 \times 2^2) \div 3^2 + 4) \div 2$

Solution

(a) $4^2 \div (12 - 8) = 16 \div 4$
$= 4$

(b) $25 - (2 + 6 \times 3) = 25 - (2 + 18)$
$= 25 - 20$
$= 5$

(c) $27 \div 3^2 + (20 - 2^3) = 27 \div 3^2 + (20 - 8)$
$= 27 \div 3^2 + 12$
$= 27 \div 9 + 12$
$= 3 + 12$
$= 15$

(d) $((44 - 2 \times 2^2) \div 3^2 + 4) \div 2 = ((44 - 8) \div 3^2 + 4) \div 2$
$= (36 \div 3^2 + 4) \div 2$
$= (36 \div 9 + 4) \div 2$
$= (4 + 4) \div 2$
$= 8 \div 2$
$= 4$

REMARK

When there are multiple operations or exponents inside the parentheses, make sure you follow the correct order of operations inside the parentheses as well.

Try It! 9

Evaluate the following expressions.

(a) $17 + (21 + 3^2) \div (5 \times 2)$

(b) $5^2 \div (48 - 43) \times (2 + 3)$

(c) $(4^2 - 8 + 2 \times 10) \div (3^2 - 5)$

(d) $(8 \times (64 \div 4^2 + 2)) + 6^2 \div 4$

BASIC PRACTICE

1. Write an expression for each of the following statements. Then evaluate each expression.

(a) 8 more than the product of 14 and 7.

(b) 4 less than the quotient of 36 by 6.

(c) The quotient of 48 by 8 decreased by 6.

(d) The sum of 10 and 5 increased by the quotient of 45 by 5.

2. Express the following using exponents.

(a) $5 \times 5 \times 5 \times 5$

(b) 8×8

(c) $10 \times 10 \times 10 \times 10 \times 10 \times 10$

(d) $35 \times 35 \times 35$

3. Evaluate the following expressions.

(a) 25^2

(b) 7×10^4

(c) 5×3^2

(d) $8^2 - 2^3$

Example 12

Find the least common multiple of 6 and 8.

(a) List the first 10 multiples of 6.
(b) List the first 10 multiples of 8.
(c) In the multiples you have listed, what multiples are common to both 6 and 8?
(d) What is the least common multiple of 6 and 8?

Solution

(a) The first 10 multiples of 6 are 6, 12, 18, 24, 30, 36, 42, 48, 54, and 60.

(b) The first 10 multiples of 8 are 8, 16, 24, 32, 40, 48, 56, 64, 72, and 80.

(c) The multiples that are common to both 6 and 8 are 24 and 48.

6, 12, 18, **24**, 30, 36, 42, **48**, 54, and 60.

8, 16, **24**, 32, 40, **48**, 56, 64, 72, and 80.

(d) The least common multiple of 6 and 8 is 24.

DISCUSS

Are 72 and 96 common multiples of 4 and 6? Explain.

Try It! 12

Find the least common multiple of 10 and 15.

(a) List the first 10 multiples of 10.
(b) List the first 10 multiples of 15.
(c) In the multiples you have listed, what multiples are common to both 10 and 15?
(d) What is the least common multiple of 10 and 15?

FURTHER PRACTICE

1. List the factors of

(a) 64,
(b) 48.

2. List the first 10 multiples of

(a) 8,
(b) 16.

3. Find the following.

(a) The greatest common factor of 18 and 24.
(b) The greatest common factor of 36 and 54.
(c) The least common multiple of 5 and 6.
(d) The least common multiple of 8 and 12.

CISE 1.4

BASIC PRACTICE

1. Mentally divide the following.

(a) $84 \div 7$ **(b)** $128 \div 8$
(c) $276 \div 6$ **(d)** $600 \div 10$
(e) $7{,}000 \div 100$ **(f)** $2850 \div 50$

FURTHER PRACTICE

2. Evaluate the following expressions.

(a) $28 \div 4 + 3 \times 2^4$
(b) $15 + 4^3 \div 2 \times 2^2 - 8$
(c) $5^3 \div (5 \times 3 - 10)$
(d) $175 - (13 + 7^2) \div 2$
(e) $(56 - 2 \times 8) \div 2^3 - 3 + 5^2$

3. Fill in the boxes with the appropriate numbers. Then check your answer by evaluating both sides of the equation.

(a) $48 \div 8 = (48 \div \square) \div (8 \div 4)$

(b) $16 \div 4 = (16 \times 2) \div (4 \times \square)$

4. Mentally calculate the following.

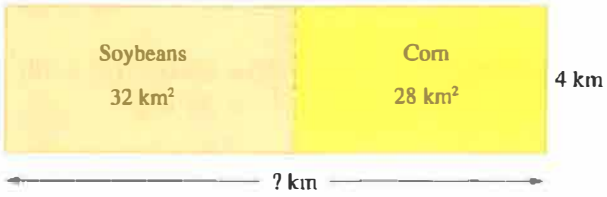
(a) $6{,}300 \div 700$ **(b)** $9{,}720 \div 90$
(c) $135 \div 15$ **(d)** $306 \div 18$
(e) $22{,}500 \div 250$ **(f)** $456 \div 24$

MATH @ WORK

5. Twelve friends are out for dinner at a restaurant. Their bill is $216.

(a) How much does each person have to pay if they share the cost equally?
(b) They want to leave a $24 tip. How much does each person have to pay including the tip?

6. A farmer plants one section of a rectangular field with corn and the other section with soybeans. The areas of each section and the width of the field are shown below. What is the length of the field?



BRAIN WORKS

7. Sarah said that to solve $90{,}000 \div 18{,}000$, she could just do $45 \div 9$.

(a) Does her method work? Explain why.
(b) Think of another division expression that can be solved using a similar method.

8. You are given the the following expression.

$144 \div 24 = (144 \div \square) \div (24 \div \square)$

(a) Think of at least 3 different numbers that can go in $\square$ and write the expressions.
(b) Check your expressions to make sure your answers are equal to the quotient of $144 \div 24$.
(c) Which number in **(a)** makes the calculation of $144 \div 24$ the easiest? Explain why.

Multiplication of Fractions

1. Multiply a fraction by a whole number.

$$\frac{a}{b} \times c = \frac{a \times c}{b}$$

Example $\frac{2}{3} \times 2 = \frac{2 \times 2}{3}$

$$= \frac{4}{3}$$

$$= 1\frac{1}{3}$$

2. Multiply a fraction by a fraction.

$$\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$$

$$= \frac{ac}{bd}$$

Example $\frac{2}{5} \times \frac{10}{11} = \frac{2 \times \cancel{10}^{2}}{\cancel{5}_{1} \times 11}$

$$= \frac{2 \times 2}{1 \times 11}$$

$$= \frac{4}{11}$$

Division of Fractions

1. The reciprocal of $\frac{a}{b}$ is $\frac{b}{a}$.

Example $\frac{2}{3}$ **and** $\frac{3}{2}$, $\frac{1}{4}$ **and 4, and** 5 and $\frac{1}{5}$ are reciprocals of each other.

2. Divide a whole number by a fraction.

$$a \div \frac{b}{c} = a \times \frac{c}{b}$$

Example $4 \div \frac{2}{7} = \cancel{4}^{2} \times \frac{7}{\cancel{2}_{1}}$

$$= 2 \times \frac{7}{1}$$

$$= 14$$

3. Divide a fraction by a whole number.

$$\frac{a}{b} \div c = \frac{a}{b} \times \frac{1}{c}$$

Example $\frac{1}{5} \div 6 = \frac{1}{5} \times \frac{1}{6}$

$$= \frac{1}{30}$$

4. Divide a fraction by a fraction.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$

Example $\frac{4}{3} \div \frac{2}{9} = \frac{\cancel{4}^{2}}{\cancel{3}_{1}} \times \frac{\cancel{9}^{3}}{\cancel{2}_{1}}$

$$= \frac{2}{1} \times \frac{3}{1}$$

$$= 6$$

Method 2

Number of U.S. stamps $= \frac{4}{7} \times 336 = 192$

Number of Canada stamps $= \frac{1}{2} \times 192 = 96$

Number of China stamps $= 336 - 192 - 96$
$= 48$

Now, $192 - 48 = 144$.

There are 144 more U.S. stamps than China stamps.

Try It!

There are 216 coins. $\frac{5}{9}$ of them are British coins, and the rest are Russian and Indian coins. There are $\frac{1}{2}$ as many Indian coins as British coins. How many more British coins than Russian coins are there?

BASIC PRACTICE

1. Evaluate the following expressions. Change products that are improper fractions to mixed numbers.

(a) $\frac{4}{5} \times 8$ **(b)** $7 \times \frac{3}{10}$

(c) $\frac{5}{6} \times \frac{1}{5}$ **(d)** $\frac{4}{7} \times \frac{3}{5}$

(e) $\frac{9}{10} \times \frac{4}{7}$ **(f)** $\frac{7}{8} \times \frac{2}{3}$

(g) $\frac{2}{9} \times \frac{3}{11}$ **(h)** $\frac{8}{25} \times \frac{15}{16}$

FURTHER PRACTICE

2. Evaluate the following expressions. Express any improper fractions to mixed numbers.

(a) $\frac{8}{5} \times \frac{3}{4}$ **(b)** $2\frac{1}{10} \times 3$

(c) $2\frac{1}{2} \times \frac{3}{5}$ **(d)** $3\frac{1}{3} \times \frac{9}{7}$

(e) $5\frac{1}{5} \times 1\frac{3}{8}$ **(f)** $2\frac{3}{4} \times 1\frac{1}{10}$

3. Mrs. Lin had $\frac{3}{5}$ pound of flour. She used $\frac{5}{8}$ of it to make a cake. How much flour did she use?

4. A rectangular garden has a length of $3\frac{3}{5}$ m and a width of $2\frac{1}{2}$ m. What is the area of the garden?

5. Each serving of sorbet is $\frac{3}{10}$ liter. How many liters will $2\frac{1}{2}$ servings be?

6. A basketball weighs $1\frac{5}{8}$ pounds. How many pounds do 16 of these basketballs weigh?

7. Jessica had \$460. She spent $\frac{3}{4}$ of her money on a computer. How much money did she have left?

BASIC PRACTICE

1. Find the reciprocal of each of the following numbers.

   (a) $\frac{5}{9}$ (b) $\frac{1}{6}$

   (c) 7 (d) $5\frac{2}{3}$

2. Evaluate the following expressions.

   (a) $\frac{5}{6} \div 7$ (b) $\frac{7}{9} \div 2$

   (c) $10 \div \frac{1}{2}$ (d) $6 \div \frac{4}{7}$

   (e) $\frac{7}{8} \div \frac{3}{16}$ (f) $1\frac{2}{3} \div \frac{10}{21}$

   (g) $\frac{14}{15} \div \frac{2}{3}$ (h) $5\frac{4}{9} \div 3\frac{1}{2}$

FURTHER PRACTICE

3. Evaluate the following expressions.

   (a) $\frac{9}{14} \times \frac{7}{9} \div 3$

   (b) $\left(\frac{1}{2} + \frac{1}{4}\right) \times 6 \div \frac{1}{3}$

   (c) $3\frac{1}{5} \div \frac{8}{15} - \frac{3}{4} \times \frac{5}{6}$

   (d) $5 - 3 \div 2\frac{1}{4} \times \frac{3}{8}$

4. Jane baked a $\frac{4}{5}$-kilogram butter cake. She gave each of the children in her class $\frac{2}{25}$ kilogram of the cake. How many children are there in Jane's class?

5. If $4\frac{1}{2}$ ounces of silver cost \$99, how much does 1 ounce of silver cost?

6. How much almonds will each person get if 20 people share $2\frac{2}{5}$ kilograms of almonds?

MATH @ WORK

7. A large bottle holds $2\frac{1}{4}$ liters of juice and a small bottle holds $\frac{3}{8}$ liter. How many times as much juice does the large bottle hold as compared to the small bottle?

8. How many $\frac{3}{4}$-cup servings can you get from $3\frac{3}{8}$ cups of sauce?

9. Jessica had $5\frac{1}{3}$ meters of ribbon. She used $\frac{1}{4}$ of it to wrap a present and cut the remainder of the ribbon into $\frac{1}{4}$-meter-long pieces. How many pieces did she get?

10. A road crew can pave $\frac{2}{5}$ mile of road in $1\frac{1}{2}$ hours. How many miles of road can they pave in 10 hours?

BRAIN WORKS

11. Draw a model to support your answer to the division expression, $\frac{3}{5} \div \frac{1}{3}$.

12. In explaining why $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$, a student's proof is as follows:

$$\frac{a}{b} \div \frac{c}{d} = \frac{\frac{a}{b}}{\frac{c}{d}}$$

$$= \frac{\frac{a}{b} \times \frac{d}{c}}{\frac{c}{d} \times \frac{d}{c}}$$

$$= \frac{a}{b} \times \frac{d}{c}$$

Is his argument valid? Explain your answer.

IN A NUTSHELL

Convert Fractions to Decimals

Example (a) $\frac{3}{4} = \frac{3 \times 25}{4 \times 25}$

$= \frac{75}{100}$

$= 0.75$

(b) $1\frac{2}{5} = 1 + \frac{2 \times 2}{5 \times 2}$

$= 1 + \frac{4}{10}$

$= 1 + 0.4$

$= 1.4$

Convert Decimals to Fractions

Example (a) $0.25 = \frac{25}{100}$

$= \frac{1}{4}$

(b) $1.2 = 1 + \frac{2}{10}$

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

$= 1\frac{1}{5}$

Adding and Subtracting Decimals

- Write the numbers in vertical form by aligning the decimal points and the place values.
- Write zeros as needed to have the same number of places in each number.

Example

(a) Add 2.8 and 3.41.

$$\begin{array}{r} {\scriptstyle 1\ \ \ \ } \\ 2.80 \\ +\ 3.41 \\ \hline 6.21 \end{array}$$

(b) Subtract 8.47 from 19.

$$\begin{array}{r} {\scriptstyle 8\ 9\ 1\ \ } \\ 19.\cancel{0}\cancel{0} \\ -\ \ 8.47 \\ \hline 10.53 \end{array}$$

Multiplying Decimals

(a) Multiply by 10, 100, and 1,000

$0.5 \times 10 = 5$

$0.5 \times 100 = 50$

$0.5 \times 1{,}000 = 500$

(b) Multiply decimals

Example 4.5×0.12

$$\begin{array}{r} 4.\ 5 \\ \times\ 0.1\ 2 \\ \hline \\ \\ 0.54 \end{array} \quad \begin{array}{c} \xrightarrow{\times\ 10} \\ \xrightarrow{\times\ 100} \\ \\ \xleftarrow{\div\ 1000} \end{array} \quad \begin{array}{r} 4\ 5 \\ \times\ 1\ 2 \\ \hline 9\ 0 \\ 4\ 5 \\ \hline 5\ 4\ 0 \end{array}$$

Therefore, $4.5 \times 0.12 = 0.54$

Dividing Decimals

(a) Divide by 10, 100, and 1,000

$0.5 \div 10 = 0.05$

$0.5 \div 100 = 0.005$

$0.5 \div 1{,}000 = 0.0005$

(b) Dividing by a decimal

Example $1.25 \div 0.4$

- Multiply the divisor by 10 to change it to a whole number. Then, multiply the numerator by the same number 10.

$$\frac{1.25}{0.4} = \frac{1.25 \times 10}{0.4 \times 10} = \frac{12.5}{4}$$

- Divide 12.5 by 4.

$$\begin{array}{r} 3.125 \\ 4\overline{)\,12.500} \\ -\,12 \\ \hline 05 \\ -\,4 \\ \hline 10 \\ -\,8 \\ \hline 20 \\ -\,20 \\ \hline 0 \end{array}$$

So, $1.25 \div 0.4 = 3.125$.

Conversion of Units

1 cm = 10 mm
1 dm = 10 cm
1 m = 10 dm
1 m = 100 cm
1 dm = 0.1 m
1 cm = 0.01 m

1,000 m = 1 km
1,000 g = 1 kg
1,000 mL = 1 L

WRITE IN YOUR JOURNAL

1. After learning the rule "add a zero when you multiply by 10," a student did the following.

   $6.5 \times 10 = 6.50$

   Is the answer correct? Explain your reasoning.

2. Without performing any division, explain why $3.8 \div 0.11$ and $380 \div 11$ have the same answer.

EXTEND YOUR LEARNING CURVE

The Magical 142857

(a) Use long division or a calculator to verify that $\frac{1}{7} = 0.142857142857\ldots$. Then compare the decimals of these fractions with that of $\frac{1}{7}$. What do you notice?

(i) $\frac{2}{7}$ (ii) $\frac{3}{7}$ (iii) $\frac{4}{7}$ (iv) $\frac{5}{7}$ (v) $\frac{6}{7}$

(b) Investigate some other interesting properties about the number 142857.

FURTHER PRACTICE

1. Write the following as decimals.

(a) $\frac{6}{10}$

(b) $\frac{43}{100}$

(c) $\frac{5}{1{,}000}$

(d) 8 tenths 9 thousandths

(e) $1\frac{3}{100}$

(f) $4\frac{19}{1{,}000}$

(g) $\frac{38}{10}$

(h) $\frac{567}{100}$

2. Write the following as decimals.

(a) 9 tens 3 ones 9 tenths

(b) 2 ones 1 tenth 3 hundredths

(c) 5 ones 2 hundredths 1 thousandth

(d) 8 ones 6 tenths 6 thousandths

3. Calculate the following.

(a)
$$\begin{array}{r} 0.27 \\ +\ 9.95 \\ \hline \\ \hline \end{array}$$

(b)
$$\begin{array}{r} 24.3 \\ +\ 8.78 \\ \hline \\ \hline \end{array}$$

(c)
$$\begin{array}{r} 18.905 \\ +\ 37.44 \\ \hline \\ \hline \end{array}$$

(d)
$$\begin{array}{r} 6.03 \\ -\ 5.26 \\ \hline \\ \hline \end{array}$$

(e)
$$\begin{array}{r} 36.2 \\ -\ 17.11 \\ \hline \\ \hline \end{array}$$

(f)
$$\begin{array}{r} 15.103 \\ -\ 9.47 \\ \hline \\ \hline \end{array}$$

4. Write in vertical form and then calculate the following expressions.

(a) 12.36 + 4.74 **(b)** 2.305 + 5.5

(c) 7 + 8.804 **(d)** 3.756 + 0.28

(e) 6.76 – 3.98 **(f)** 0.8 – 0.47

(g) 3.14 – 1.807 **(h)** 8 – 0.179

5. Express each decimal as a fraction or mixed number in simplest form.

(a) 1.12

(b) 0.065

(c) 22.06

(d) 3.125

6. Express each fraction as a decimal.

(a) $\frac{3}{5}$

(b) $\frac{7}{4}$

(c) $4\frac{3}{50}$

(d) $2\frac{3}{8}$

7. Calculate the following.

(a) 1.23 + 45.6 + 0.789

(b) 3.46 + 12.8 – 9.23

(c) 15.3 – 1.268 + 3.76

(d) 8 – 0.35 – 2.009

(e) 137 – (3.087 + 0.99)

(f) 65.4 – (42.7 – 11.86)

(g) 2.86 + 3.057 – (1.005 – 0.999)

(h) 21 – 9.64 – (1.7 + 5.755)

8. Arrange these numbers in increasing order.

$$4\frac{2}{25},\ 4.1,\ 4.088,\ 4\frac{3}{100}$$

MATH @ WORK

9. Mr. Bravo bought some tortillas for $3.87 and some beans for $2.67. He paid for the food using a $10 bill. How much change did he receive?

10. Eliza, Abbie, and Jackie went shopping. They spent a total of $200. Eliza spent $87.50. Abbie spent $58.36. How much did Jackie spend?

3. Fill in the ☐ with the appropriate number to make each of the following expressions equivalent. Then find the quotient.

(a) $5.16 \div 1.2 = \square \div 12$

(b) $0.207 \div 0.9 = \square \div 9$

(c) $0.006 \div 0.04 = \square \div 4$

(d) $39 \div 0.15 = \square \div 15$

4. Divide completely.

(a) $6.54 \div 6$ (b) $13.16 \div 2.8$

(c) $42.16 \div 17$ (d) $0.387 \div 0.03$

(e) $5 \div 8$ (f) $0.3 \div 4$

FURTHER PRACTICE

5. Divide and round the quotient to two decimal places.

(a) $2.83 \div 0.56$ (b) $16.79 \div 1.5$

(c) $0.009 \div 0.64$ (d) $5 \div 6$

6. A 2.8-meter-long ribbon costs \$4.90. How much would a 1-meter ribbon cost?

7. A metal pipe measuring 3.5 meters weighs 12.67 kilograms. How much does 1 meter of this pipe weigh?

8. A rectangular garden has an area of 25.3 m^2 and a width of 4.4 m. What is the length of the garden?

9. A store wants to pack 36 pounds of coffee in 2.25-pound bags. How many bags of coffee will they be able to pack?

10. If 0.8 ounce of silver cost \$10.79 on a certain day, what was the cost per ounce of silver on that day? Round your answer to the nearest cent.

11. Shane ran 21 kilometers in 2.6 hours. How far did he run in 1 hour? Round your answer to 3 decimal places.

MATH @ WORK

12. Zoltan weighs 62 kilograms. He weighs 2.5 times as much as his sister and 0.8 times as much as his father. What is the weight of his sister and of his father?

13. Jeannie spent \$14.50 on 5 pounds of oranges and 3 pounds of apples. The apples cost \$2.55 per pound. How much does 1 pound of oranges cost?

14. A 12.5-ounce bottle of coffee powder costs \$10.50. An 8.8-ounce bottle of the same coffee costs \$7.92. Which bottle of coffee offers a better deal? How much is the savings in cents?

15. At a fabric store, 12 yards of burlap fabric cost \$57 and 15 yards of cotton fabric cost \$78.75. Which fabric costs more per yard? How much more?

BRAIN WORKS

16. Julia's reasoning

In the repeating decimal 0.99999..., the number of 9's is infinite. If we do $1 - 0.99999...$, we will get 0.000....01, where the last digit will be a 1. So, 0.99999... is less than 1.

Emily's reasoning

By division,

$\frac{1}{9} = 0.11111...$

$\frac{9}{9} = 9 \times 0.11111...$

$= 0.99999...$

Since $\frac{9}{9} = 1$, so $0.99999... = 1$.

Who is right? Explain your answer.

17. Paul claimed that when 2 is divided by 0.3, the remainder is 2, as shown below.

$$\frac{2}{0.3} = \frac{20}{3}$$

Now, $20 = 3 \times 6 + 2$

Hence, the reminder of $\frac{2}{0.3}$ is also 2.

Is his reasoning correct? Explain.

BASIC PRACTICE

1. Convert the following.
   (a) 1.8 m to centimeters
   (b) 4.567 kg to grams
   (c) 4.08 L to liters and milliliters

2. Express the following as a decimal.
   (a) 3,750 mL in liters
   (b) 28.6 cm in meters
   (c) 16 km 87 m in kilometers

FURTHER PRACTICE

3. There are two dogs in a pet store. Mila weighs 9.5 kilograms. Bailey weighs 850 grams less than Mila. What is Bailey's weight in kilograms?

4. Stephanie is 1.6 meters tall. Her sister, Jacqueline, is 4 centimeters taller than her. How tall is Jacqueline in meters?

5. One bottle holds 350 milliliters of water. How much water do five of these bottles hold in liters?

6. One baseball weighs 150 grams. There is a bag of baseballs that weighs 2.7 kilograms. How many baseballs are in the bag? Assume the weight of the bag is negligible.

MATH @ WORK

7. A store owner has two bags of peanuts, each weighing 2.4 kilograms. He wants to put the peanuts in smaller bags that weigh 60 grams each. How many of the smaller bags of peanuts can he make?

8. Danny has 3.8 meters of ribbon. He uses 1.4 meters to wrap presents, and cuts the remainder into 8 equal pieces for an art project. How long is each piece in centimeters?

9. A large bottle contains 750 milliliters of juice and a small bottle contains 400 milliliters of juice. A sixth grade class took 5 large bottles and 12 small bottles of juice on a field trip. How much juice did they take in liters?

BRAIN WORKS

10. The speed of sound has been calculated at 343.2 meters per second.
    (a) How many kilometers can sound travel in 1 minute? Round your answer to the nearest tenth of a kilometer.
    (b) A person hears thunder 10 seconds after seeing lightning. About how many kilometers away is that person from where the lightning struck? Round your answer to the nearest tenth of a kilometer.

11. Given that $3.85 \times 4.24 = 16.324$, find the values of the following.
    (a) $163.24 \div 0.004\,24$
    (b) $0.016\,324 \div 385$
    (c) $0.0424 \times 3{,}850$

12. Samuel is thinking of a number. When he divides it by 6 and adds 2.3 to the answer, he gets 4. What number is he thinking of?

13. Rowan divided a 2-digit number by another 2-digit number and obtained 0.781 25 as the answer. What are the two numbers?

IN A NUTSHELL

Positive and Negative Numbers

A **positive number** has a value that is greater than zero.

Example $4, 0.6, \frac{3}{4}, 2\frac{1}{3}$

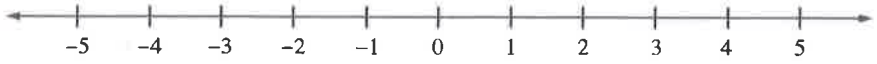
A **negative number** has a value that is smaller than zero.

Example $-2, -1.2, -\frac{5}{7}, -3\frac{1}{6}$

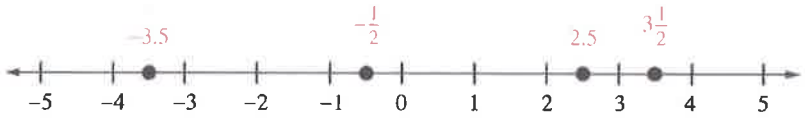
- **Zero** is neither positive nor negative.
- A positive or negative whole number is called an **integer**.
- Positive numbers and negative numbers include **whole numbers**, **fractions**, and **decimals**.

Number Line

A **number line** is divided into equal intervals. It can be used to represent numbers.



From the number line, we can see that the opposite of 4 is −4 and the opposite of −3 is 3. A number and its opposites are at an equal distance from the origin. For example, the opposite of 4 is −4, and both 4 and −4 are 4 units from the right and left of the origin 0 respectively.



Absolute Value

On a number line, the **absolute value** denotes the distance of a positive or negative number from zero.

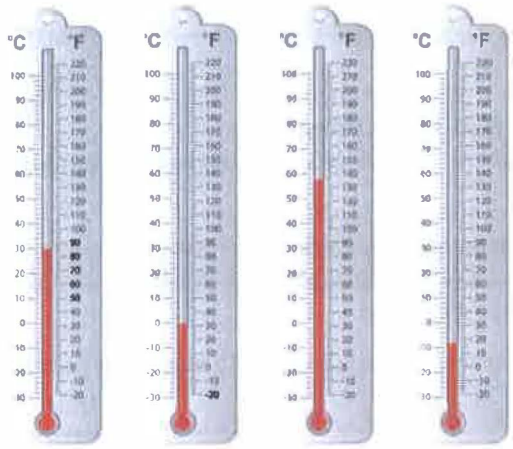
Example
$|87| = 87$
$|-225| = 225$
$|0| = 0$

- Numbers with opposite signs indicate that their locations are on opposite sides of 0, and are at an equal distance from 0 on the number line.
- To compare a negative number with another negative number, you can find the absolute value of each number. Negative numbers with greater absolute values are less than negative numbers with smaller absolute values.

Example $|-12| > |-5|$ but $-12 < -5$

BASIC PRACTICE

1. Express each temperature in degrees Celsius using a positive number, a negative number, or zero.



A *B* *C* *D*

2. Express the following real-world situations using positive and negative numbers.

(a) An elevation of 333.75 meters above sea level
(b) A temperature of 5 degrees below 0°F
(c) A golf score of 10 under par
(d) An elevation of 427 meters below sea level
(e) A temperature of 20 degrees above 0°C

3. Express the following situations using positive and negative numbers.

(a) A drop in temperature of 15°F
(b) A credit of $85 to a checking account
(c) A bank deposit of $100
(d) A car driving at 8 miles per hour above the speed limit
(e) A debit to a checking account of $300.50
(f) A withdrawal of $980.55 from a bank account
(g) A $3\frac{1}{2}$-centimeter increase in the height of a plant
(h) A weight loss of $7\frac{3}{4}$ lb

FURTHER PRACTICE

4. The speed limit on a highway is 55 mph. The speeds of five cars clocked by radar are tabulated below.

Car	A	B	C	D	E
Speed (mph)	65	50	55	53	60.5

Express the difference between the speed limit and the speed of each car using a positive number, a negative number, or zero.

5. The table below shows the credit and debit amounts from Michelle's bank account in August.

Date	Debit	Credit
August 5	$240.00	
August 9		$125.50
August 21		$320.00
August 23	$192.40	
August 30		$71.00

Use positive or negative numbers to express the balance on each day in the table below. The initial balance is $100.

Date	Balance Amount
August 5	
August 9	
August 21	
August 23	
August 30	

MATH@WORK

6. At the beginning of the year, a dog weighed 10 pounds. At the end of the year, the dog weighed 40 pounds.

(a) How did the dog's weight change over the one-year period?

(b) Express the dog's weight change using a positive or negative number.

7. The heights in meters of some tall buildings in New York and Chicago are shown in the table below.

Building	Freedom Tower	Empire State Building	Willis Tower	Aon Center
Height (m)	541	381	442	346

A helicopter lands on top of Willis Tower. Express the position of the helicopter with reference to the top of each of the other buildings as the base, using positive or negative numbers.

BRAINWORKS

8. Consider the sum $1 - 1 + 1 - 1 + 1 - 1 \cdots$, where the terms continue alternating -1 and $+1$. The sum of the first two terms is $1 - 1 = 0$.

(a) Find the sum of the first 10 terms

(b) Find the sum of the first 15 terms

(c) Find the sum of the first 231 terms

Explain how you get your answer.

9. What is the value of $1 - (-(-(-2)))$?

10. A scuba diver dives 83 feet below sea level, and then rises 47 feet. What is the position with relation to sea level?

11. At 08:00, one winter morning, the temperature in Moscow was $-3°C$. Between 08:00 and 09:00, the temperature increased by 5°C. What was the temperature at 09:00?

12. The table shows the temperature of two towns at 10 P.M. on a certain day. Find the difference between the temperatures.

Town X	$-2°F$
Town Y	$-6°F$

Example 9 John's bank account balance shows –$110. How much does he owe the bank? Explain your answer in terms of absolute value.

Solution $|-110| = 110$

The size of the debt in dollars is 110.
John owes the bank $110.

Try It! 9 Amy's bank account balance shows –$3,000. How much does she owe the bank? Explain your answer in terms of absolute value.

EXERCISE 4.2

BASIC PRACTICE

1. **(a)** Represent the numbers 7.5, 5, 0, and $4\frac{1}{2}$ on a horizontal number line.
(b) Arrange the numbers in ascending order.
(c) Arrange the numbers in descending order.

2. **(a)** Represent the numbers 10, –10, 0, $6\frac{3}{4}$, and 8.5 on a vertical number line.
(b) Arrange the numbers in ascending order.
(c) Arrange the numbers in descending order.

3. Fill in the blanks with >, <, or =.
(a) –57 ____ –185
(b) –4 ____ –300
(c) –7 ____ 0
(d) 44 ____ 444
(e) –60 ____ 60

4. Fill in each blank with >, <, or =.
(a) $|0|$ ____ $|-8|$
(b) $|17|$ ____ $|5|$
(c) $|-3|$ ____ $|-7|$
(d) $|500|$ ____ $|-1{,}000|$

FURTHER PRACTICE

5. Fill in the blanks with >, <, or =.
(a) –41.5 ____ –41.05
(b) –28.6 ____ –30
(c) 0 ____ $\left|-4\frac{1}{2}\right|$
(d) 57 ____ 50.35
(e) –0.007 ____ –0.02

6. Fill in each blank with >, <, or =.
(a) $|0|$ ____ $\left|-\frac{7}{8}\right|$
(b) $\left|-5\frac{5}{8}\right|$ ____ $\left|-\frac{40}{8}\right|$
(c) $\left|-\frac{3}{5}\right|$ ____ $\left|-\frac{3}{7}\right|$
(d) $\left|-5\frac{1}{4}\right|$ ____ 5.2

IN A NUTSHELL

The Meaning of Percent

The part of the whole expressed in hundredths is called the percent. The symbol for percent is "%".

Example

$$1\% = \frac{1}{100}$$

$$23\% = \frac{23}{100}$$

$$100\% = 1$$

Conversion Between Percents, Fractions and Decimals

- Convert Fractions and Decimals to Percents

Example

$$\frac{3}{4} = \frac{3}{4} \times 100\% \quad \text{Multiply by 100\%}$$

$$= 75\%$$

$$0.429 = 0.429 \times 100\% \quad \text{Move the decimal point two places to the right.}$$

$$= 42.9\%$$

- Convert Percents to Fractions and Decimals

Example

$$36\% = \frac{36}{100} \quad \text{Divide by 100.}$$

$$= \frac{9}{25}$$

$$7.89\% = \frac{7.89}{100} \quad \text{Move the decimal point two places to the left.}$$

$$= 0.0789$$

Percentage of a Quantity

We can use 10%, 25%, and 1% to find other percentages of a quantity.

- To find 10% of a number, divide the number by 10.
- To find 25% of a number, divide the number by 4.
- To find 1% of a number, divide the number by 100.

We can find the percentage of a quantity by multiplying the quantity by a fraction with 100 as the denominator or by its equivalent decimal.

Example To find 67% of 500, we can multiply 500 by $\frac{67}{100}$ or multiply 500 by 0.67.

Method 2

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

$$\frac{3}{5} \times 100\% = 60\%$$

60% of the students are non-sixth graders.

Try It! 7 Out of 25 apples in a basket, 18 are green apples and the rest are red apples. What percent of the apples are red apples?

7.1

BASIC PRACTICE

1. Express each fraction as a percent.

(a) $\frac{7}{20}$ **(b)** $\frac{12}{25}$

(c) $1\frac{3}{5}$ **(d)** $\frac{9}{4}$

2. Express each decimal as a percent.

(a) 0.7 **(b)** 0.07

(c) 1.8 **(d)** 0.354

3. Express each percent as a fraction in simplest form.

(a) 42.5% **(b)** 0.8%

(c) 240% **(d)** $3\frac{1}{2}\%$

4. Express each percent as a decimal.

(a) 30.7% **(b)** 9.05%

(c) $1\frac{3}{4}\%$ **(d)** 166%

FURTHER PRACTICE

5. Express $\frac{2}{7}$ as a percent rounded to one decimal place.

6. Of all the beads in a box, $\frac{9}{16}$ are red beads. What percent of the beads in the box are red beads?

7. Madison wants to buy a dress at a store that sells it at "25% off" the regular price. What percent of the regular price does she have to pay?

Method 2

$75\% = \frac{3}{4}$ and the number of boys is equal to $\frac{3}{4}$ of the number of girls.

$\frac{3}{4} \times 24 = 18$

Method 3

$100\% - 75\% = 25\%$

There are 25% of 24 more girls than boys in the class.

$25\% \times 24 = 6$

There are 6 more girls than boys in the class.
Since there are 24 girls in the class, there are $24 - 6 = 18$ boys in the class.

There are 18 boys in the class.

Try It! 18 There are 31.2% fewer cows than goats on a farm. If there are 86 cows, how many goats are there on the farm?

BASIC PRACTICE

1. Find the following amounts.

(a) 10% of 40 mi
(b) 50% of \$300
(c) 30% of 180 kg
(d) 25% of 68 lb
(e) 70% of 260 m
(f) 75% of 292 kg

2. Find the following amounts.

(a) 110% of \$875
(b) 1.2% of 3,000 mi
(c) $\frac{3}{4}$% of 760 m
(d) $1\frac{15}{25}$% of 54 L
(e) 65% of \$680
(f) 14% of 750 L
(g) 27% of 540 kg
(h) 99% of 7,000 km

FURTHER PRACTICE

3. Brandon had \$500. He spent 47% of his money on a tablet computer. How much did the tablet computer cost?

4. Maya bought 350 grams of peanuts. She used 58% of the peanuts to make peanut butter. How many grams of peanuts did she use to make peanut butter?

5. A sound system originally costs \$412. Angie bought it on sale for 75% of its original cost. How much did she pay for the sound system?

6. In a box, 72% of the beads are red beads and the rest are blue beads. There are 576 red beads. How many beads are there altogether?

7. 42% of a number is 231. What is the number?

Writing Algebraic Expressions

We can use algebra to write expressions when a value is not known. A letter representing an unknown value in an algebraic expression is called a **variable**.

For example: $x + 3$ means "3 more than a number x."
$3y - 2$ means "2 less than the product of 3 and y."
The variable in the expression $x + 3$ is x and the variable in $3y - 2$ is y.

Evaluating Algebraic Expressions

If we know the value of the variable in an algebraic expression, we can evaluate the expression by substituting the value for the variable.

For example: Evaluate $n + 2$, when $n = 5$.
When $n = 5$, $n + 2 = 5 + 2 = 7$.

Simplifying Expressions

We can simplify an expression by adding or subtracting the like terms.

Like terms: $3x$ and $2x$, 5 and 12
Unlike terms: 5 and $3y$, $2x$ and y, y^2 and $2y$

Equivalent Expressions

When two expressions have the same values for all possible numbers of all their variables, they are **equivalent expressions**.

We can show whether two expressions are equivalent by simplifying one or both expressions to see if they are identical.

EXERCISE 8.1

BASIC PRACTICE

1. Write an algebraic expression for each of the following statements.

(a) 7 more than y
(b) 5 less than x
(c) w more than 9.1
(d) p less than $\frac{3}{4}$

2. Write an algebraic expression for each of the following statements.

(a) The product of n and 17
(b) The product of 8 and p
(e) n to the sixth power
(d) The product of q and $\frac{5}{8}$

3. Write an algebraic expression for each of the following statements.

(a) The quotient when $3x$ is divided by 5
(b) The quotient when x is divided by 3
(c) The quotient when $2y$ is divided by 7
(d) The quotient when a is divided by 4

4. Evaluate the following expressions when $a = 3$.

(a) $a + 7$
(b) $5a$
(c) $12 - a$
(d) a^4
(e) $\frac{a}{3}$
(f) $\frac{5}{6}a$

FURTHER PRACTICE

5. Write an algebraic expression for each of the following statements.

(a) 12 plus the quotient of $7x$ by 10
(b) $\frac{3}{5}$ more than the product of x and $\frac{1}{3}$
(c) 6 minus the product of m and 0.4
(d) 8.2 less than the quotient of n by 8
(e) 2 more than x squared

6. Evaluate the following expressions when $x = 5$.

(a) $30 - 2x$
(b) $x + \frac{2}{3}$
(c) $8 + \frac{x}{10}$
(d) $\frac{4x}{5} - 4$
(e) $\frac{3}{4}x + \frac{1}{4}$
(f) $0.7x + 2.3$
(g) $\frac{3}{10}x + 0.8$
(h) $x^2 - 5$

7. Evaluate the following expressions when $x = \frac{3}{4}$.

(a) $4x + 3$
(b) $x - \frac{1}{2}$
(c) $7x - 3$
(d) $0.5 + 12x$
(e) $\frac{2}{3}x - \frac{1}{4}$
(f) $\frac{4x}{5}$
(g) $\frac{x}{3} + 1$
(h) $\frac{8x}{3} - 0.5$

MATH@WORK

8. Nicole and Grace share a birth date, but Grace is 5 years older.

(a) If Nicole is 15 years old, how old is Grace?
(b) If Nicole is p years old, how old is Grace?
(c) If Grace is q years old, how old is Nicole?

Example 23 Use the distributive property to write an equivalent expression for each of the following.

(a) $2x + 6$ **(b)** $15 - 10y$

Solution

(a) $2x$ and 6 have a common factor of 2.

$2x + 6 = 2 \times x + 2 \times 3$

$= 2 \times (x + 3)$

$= 2(x + 3)$

$2x$ ↓ $2 \times x$; 6 ↓ 2×3

(b) 15 and $10y$ have a common factor of 5.

$15 - 10y = 5 \times 3 - 5 \times 2y$

$= 5 \times (3 - 2y)$

$= 5(3 - 2y)$

15 ↓ 5×3 ; $10y$ ↓ $5 \times 2y$

Try It! 23 Use the distributive property to write an equivalent expression for each of the following.

(a) $6n + 8$ **(b)** $9 - 3x$

(c) $8y + 4$ **(d)** $14y - 21$

EXERCISE 8.2

BASIC PRACTICE

1. Simplify the following expressions.

(a) $4p + 2p$ **(b)** $c + 7c$

(c) $3n + 2n + n$ **(d)** $x + x + x + x + x$

2. Simplify the following expressions.

(a) $10y - 2y$ **(b)** $12x - x - 4x$

(c) $2m - m + 5m$ **(d)** $11k - 7k - 4k$

3. Simplify the following expressions.

(a) $3y + 2y + 7$ **(b)** $15 + y - y$

(c) $7a - 2a - 3$ **(d)** $13 + 3x - x$

4. Determine if the following expressions are equivalent.

(a) $5p + 8$ and $2p + 6 + 3p + 2$

(b) $3x + 5 - x + 2$ and $7x + 10 - 5x - 3$

(c) $8 + 5y - 6 - y$ and $8y + 9 - 5y - 7$

(d) $5t + 9 - t - 6 + 2t$ and $11t + 11 - 7 - 5t$

FURTHER PRACTICE

5. Simplify the following expressions.

(a) $3y + 7 - y$

(b) $6a + 5 + a - 4$

(c) $15 + 7q - 10 - q$

(d) $5x + 2 - x + 3$

IN A NUTSHELL

Algebraic Equations

An **equation** is a statement of equality between two expressions.For example,

$$x + 7 = 11, \quad 1.2y = 24, \quad \frac{n}{10} = \frac{3}{5}.$$

A **solution** of an equation is a numerical value which, when **substituted** for the variable in the equation, makes the equation true.

Example: Determine whether $x = \frac{2}{3}$ is a solution of the equation $9x = 6$.

$$9 \times \frac{2}{3} = 3 \times 2$$
$$= 6$$
$$6 = 6$$

Thus, $x = \frac{2}{3}$ is a solution of $9x = 6$.

Methods of Solving Linear Equations in One Variable, x

- Add the same number to both sides

  For example, $x - 3 = 6$
  $$x - 3 + 3 = 6 + 3$$
  $$x = 9$$

- Subtract the same number from both sides

  For example, $x + 2 = 14$
  $$x + 2 - 2 = 14 - 2$$
  $$x = 12$$

- Multiply both sides by the same number

  For example, $\frac{x}{5} = 6$
  $$\frac{x}{5} \times 5 = 6 \times 5$$
  $$x = 30$$

- Divide both sides by the same number

  For example, $4x = 12$
  $$\frac{4x}{4} = \frac{12}{4}$$
  $$x = 3$$

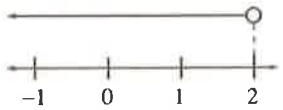
Algebraic Inequalities

- Examples of simple inequalities are:
  $$x < 2 \text{ and } x \geq -5$$
- An inequality has an infinite number of solutions that will make it true. For example, 1, 0, –2.6, and –7 are all solutions for $x < 2$.

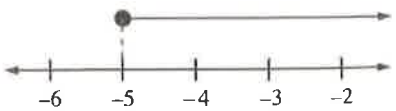
  –5, –1, 0, and $4\frac{1}{3}$ are all solutions for $x \geq -5$.

Graphing Inequalities

- It is not possible to write every solution for an inequality, but we can represen all of the solutions by graphing them on a number line.
- The number line diagram on the right shows the solution to $x < 2$.
- The open circle indicates that 2 is not part of thc solution.
- The arrow indicates that every number to the left is a solution to $x < 2$.



- The number line diagram on the right shows the solution to $x \geq -5$.
- The closed circle indicates that –5 is part of the solution.
- The arrow indicates that evry number to the right is a solution to $x \geq -5$.



Method 2

$$\frac{3}{5}x = 36$$

$$\frac{5}{3} \times \frac{3}{5}x = \frac{5}{3} \times 36$$ Multiply both sides of the equation by the reciprocal of $\frac{3}{5}$.

$$x = 60$$

The coat cost \$60.

Try It! 14 Ping took $\frac{5}{8}$ as much time as Daniel to solve a puzzle. She took 45 minutes. Write an equation for the problem and solve it to find how much time Daniel took to solve the puzzle.

BASIC PRACTICE

1. Determine whether $x = 3$ is a solution of each equation.

(a) $x + 12 = 15$ **(b)** $21 - x = 17$

(c) $7 = 11 - x$ **(d)** $48 = x + 45$

2. Determine whether $y = 12$ is a solution of each equation.

(a) $7y = 82$ **(b)** $72 = 6y$

(c) $\frac{y}{3} = 4$ **(d)** $8 = \frac{y}{2}$

3. Determine whether $x = 8$ is a solution of each equation.

(a) $\frac{35}{4} = x + \frac{3}{4}$ **(b)** $\frac{3}{2}x = 14$

(c) $2.3x = 18.2$ **(d)** $6 = \frac{3}{4}x$

4. Solve each equation and check your answer.

(a) $x + 19 = 52$ **(b)** $y - 12 = 14$

(c) $61 = n + 37$ **(d)** $26 = p - 38$

5. Solve each equation and check your answer.

(a) $8x = 104$ **(b)** $\frac{n}{7} = 23$

(c) $112 = \frac{x}{4}$ **(d)** $105 = 15x$

FURTHER PRACTICE

6. Determine whether $y = 0.6$ is a solution of each equation.

(a) $5y = 2$ **(b)** $4.2 = 7y$

(c) $\frac{2}{3}y = 0.4$ **(d)** $17.4 - y = 18$

7. Solve each equation and check your answer.

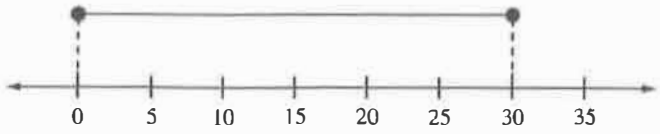
(a) $x + 8 = 11.4$ **(b)** $n + \frac{3}{10} = \frac{4}{5}$

(c) $p + 0.7 = 18.5$ **(d)** $12 = x + \frac{1}{3}$

(e) $y - \frac{3}{7} = \frac{9}{14}$ **(f)** $\frac{5}{8} = y - 6$

(g) $2.5 = q - 1.7$

(c) $0 \leq t \leq 30$, where t represents the number of minutes Kini can read.



DISCUSS

Why is the inequality not $t \leq 30$? What is the reason for specifying $t \geq 0$?

Try It! 22

For each situation, write an inequality, and graph the solution for the inequality on a number line.

(a) Jeremy has at least \$12 in his wallet.
(b) Tom has at most 50 stamps in his album.
(c) Aisha can run no faster than 8 km per hour.

EXERCISE 9.2

BASIC PRACTICE

1. Determine if 3 is a solution of the following inequalities.
   (a) $x > -4$
   (b) $x < 3.1$
   (c) $x > 3$

2. Determine if -7 is a solution of the following inequalities.
   (a) $x < -6.8$
   (b) $x > 0$
   (c) $x > -7\frac{2}{3}$

3. Graph the solution for each of the following inequalities on a number line.
   (a) $x > -8$
   (b) $x \geq 1$
   (c) $x \leq -4$
   (d) $x < 9$

FURTHER PRACTICE

4. Determine if $-\frac{3}{5}$ is a solution of the following inequalities.
   (a) $x < \frac{3}{5}$
   (b) $x \leq -0.999$
   (c) $x > -\frac{4}{3}$

5. Determine if 0.8 is a solution of the following inequalities.
   (a) $x > \frac{1}{2}$
   (b) $x < -800$
   (c) $x \geq -1.86$

6. Graph the solution for each of the following inequalities on a number line.
   (a) $x > -3\frac{1}{2}$
   (b) $x \leq 1.75$