2025 Summer Math Packet

7th Grade

This is the summer math packet for all students entering the 7th grade. It was designed to give extra practice in the skills they will need for 7th grade math. It is recommended that a portion of the packet be completed each week. It is due by the 1st week of the 2025-26 school year.

I have listed websites below that can be used as resources or extra practice.

I hope everyone has a wonderful summer full of fun and rest!

Many Blessings,

Mrs. Wendi O'Brien

Websites:

www.khanacademy.org

www.studentguide.org

Mixed Numbers

Write as a mixed number or whole number. Simplify.

1.) $\frac{15}{15}$

2.) $\frac{27}{9}$

3.) $\frac{32}{8}$

4.) $\frac{37}{5}$

5.) $\frac{24}{10}$

6.) $\frac{59}{8}$

7.) $\frac{27}{4}$

8.) $\frac{107}{9}$

9.) $\frac{145}{16}$

10.) $\frac{31}{8}$

Improper Fractions

Write as an improper fraction.

1.) $8\frac{2}{11}$

2.) $4\frac{3}{10}$

3.) $24\frac{6}{7}$

4.) $1\frac{7}{9}$

5.) $3\frac{1}{7}$

6.) $15\frac{1}{5}$

7.) $6\frac{2}{9}$

8.) $5\frac{3}{7}$

9.) $1\frac{5}{9}$

10.) $14\frac{6}{11}$

Order of Operations

Key Concept and Vocabulary

"Please Excuse My Dear Aunt Sally"

1st Parentheses
2nd Exponents
3rd Multiplication and Division (from left to right)
4th Addition and Subtraction (from left to right)

Simplify $4^2 \div 2 + 3(9 - 5)$.

$$\begin{aligned} 4^2 \div 2 + 3(9 - 5) &= 4^2 \div 2 + 3 \cdot 4 \\ &= 16 \div 2 + 3 \cdot 4 \\ &= 8 + 12 \\ &= 20 \end{aligned}$$

Skill Examples

1. $18 \div 2 - 4 = 9 - 4 = 5$
2. $12 \cdot (6 - 2) = 12 \cdot 4 = 48$
3. $14 \cdot 3 - 19 = 42 - 19 = 23$
4. $20 \div 10 + 21 \cdot 5 = 2 + 105 = 107$
5. $(2 + 3)^2 - 5 = 25 - 5 = 20$

Application Example

6. At a museum, 4 adults pay \$5 each and 6 children pay \$3 each. What is the total cost of the tickets?

$$\begin{aligned} 4 \cdot 5 + 6 \cdot 3 &= 20 + 18 \\ &= 38 \end{aligned}$$

∴ The total cost is \$38.

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Check your answers at BigIdeasMath.com.

Simplify.

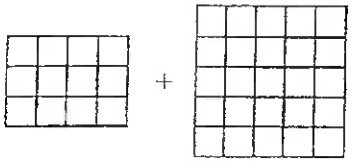
7. $3^2 + 5(4 - 2) =$ _____
8. $3 + 4 \div 2 =$ _____
9. $10 \div 5 \cdot 3 =$ _____
10. $4(3^3 - 8) \div 2 =$ _____
11. $3 \cdot 6 - 4 \div 2 =$ _____
12. $12 + 7 \cdot 3 - 24 =$ _____

Insert parentheses to make the statement true.

13. $5^2 - 15 \div 5 = 2$
14. $12 \cdot 2^3 + 4 = 144$
15. $91 - 21 \div 7 = 10$

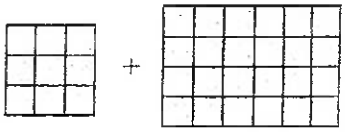
Write an expression for the total area of the two rectangles. Evaluate your expression.

16.



_____

17.



_____

18. **ADMISSION** At a baseball game, 6 adults pay \$20 each and 4 children pay \$10 each. What is the total cost of the tickets? _____

19. **INSERTING PARENTHESES** Insert parentheses in the expression $4 + 2^3 - 5 \cdot 2$ in two ways: (a) so that the value is 10 and (b) so that the value is 14.

(a) _____ (b) _____

Adding and Subtracting Fractions with Unlike Denominators

Key Concept and Vocabulary

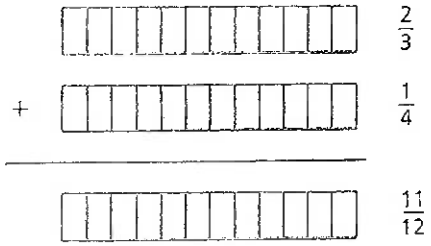
Find products.

Unlike Denominators

$$\frac{2}{3}\times\frac{1}{4}=\frac{2\cdot4+3\cdot1}{3\cdot4}=\frac{11}{12}$$

$$\frac{2}{3}\times\frac{1}{4}=\frac{2\cdot4-3\cdot1}{3\cdot4}=\frac{5}{12}$$

Visual Model



Skill Examples

1. $\frac{1}{5}+\frac{2}{3}=\frac{1\cdot3+5\cdot2}{5\cdot3}=\frac{13}{15}$
2. $\frac{1}{2}+\frac{1}{4}=\frac{1\cdot4+2\cdot1}{2\cdot4}=\frac{6}{8}=\frac{3}{4}$
3. $\frac{1}{3}-\frac{1}{4}=\frac{1\cdot4-3\cdot1}{3\cdot4}=\frac{1}{12}$
4. $\frac{3}{7}-\frac{2}{5}=\frac{3\cdot5-7\cdot2}{7\cdot5}=\frac{1}{35}$

Application Example

5. You ride your bike $\frac{3}{8}$ mile to the store. Then you ride $\frac{1}{6}$ mile to school. How far do you ride altogether?

$$\frac{3}{8}+\frac{1}{6}=\frac{3\cdot6+8\cdot1}{8\cdot6}=\frac{26}{48}=\frac{13}{24}$$

$\therefore$ You ride $\frac{13}{24}$ mile.

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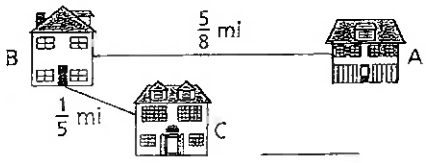
Check your answers at BigIdeasMath.com.

Find the sum or difference. Write your answer in simplified form.

6. $\frac{1}{3}+\frac{1}{8}=$ _____
7. $\frac{2}{3}+\frac{1}{5}=$ _____
8. $\frac{3}{10}+\frac{1}{4}=$ _____
9. $\frac{1}{2}+\frac{2}{5}=$ _____
10. $\frac{3}{7}+\frac{1}{3}=$ _____
11. $\frac{1}{8}+\frac{2}{5}=$ _____
12. $\frac{5}{8}-\frac{1}{3}=$ _____
13. $\frac{5}{6}-\frac{3}{5}=$ _____
14. $\frac{5}{9}-\frac{2}{5}=$ _____
15. $\frac{7}{10}-\frac{1}{4}=$ _____
16. $\frac{3}{5}-\frac{1}{6}=$ _____
17. $\frac{1}{5}-\frac{1}{6}=$ _____

Find the total distance from House A to House B and then to House C.

18. 

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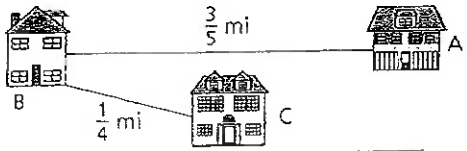
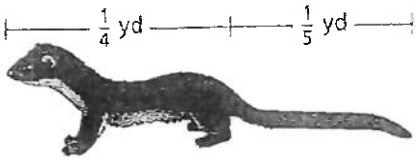
19. 

_____

20. **WEASEL LENGTH** Find the total length of the weasel. _____



21. **IMPROVING YOUR SPEED** You swam at a rate of $\frac{3}{8}$ mile per hour in March. You swam at a rate of $\frac{3}{7}$ mile per hour in April. How much faster did you swim in April? _____

Multiplying Fractions

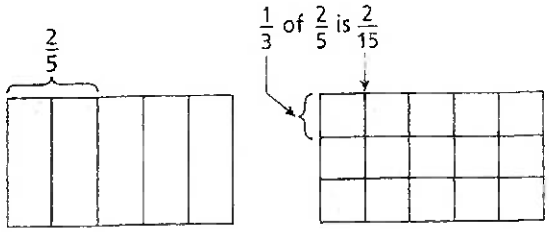
Key Concept and Vocabulary

Multiply numerators.

$$\frac{1}{3} \cdot \frac{2}{5} = \frac{1 \cdot 2}{3 \cdot 5} = \frac{2}{15}$$

Multiply denominators.

Visual Model



Skill Examples

1. $\frac{2}{3} \cdot \frac{1}{4} = \frac{2 \cdot 1}{3 \cdot 4} = \frac{2}{12} = \frac{1}{6}$
2. $\frac{3}{8} \times \frac{2}{9} = \frac{3 \cdot 2}{8 \cdot 9} = \frac{6}{72} = \frac{1}{12}$
3. $\left(\frac{2}{5}\right)\left(\frac{1}{4}\right) = \frac{2 \cdot 1}{5 \cdot 4} = \frac{2}{20} = \frac{1}{10}$
4. $\frac{1}{7} \cdot \frac{3}{5} = \frac{1 \cdot 3}{7 \cdot 5} = \frac{3}{35}$

Application Example

5. A recipe calls for three-fourths cup of flour. You want to make one-half of the recipe. How much flour should you use?

$$\frac{1}{2} \cdot \frac{3}{4} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$$

∴ You should use $\frac{3}{8}$ cup flour.

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Find the product. Write your answer in simplified form.

6. $\frac{1}{3} \cdot \frac{2}{7} =$ _____
7. $\frac{1}{2} \times \frac{1}{4} =$ _____
8. $\frac{1}{10} \cdot \frac{3}{10} =$ _____
9. $\frac{3}{2} \times \frac{2}{5} =$ _____
10. $\frac{3}{8} \times \frac{1}{2} =$ _____
11. $\left(\frac{1}{5}\right)\left(\frac{2}{5}\right) =$ _____
12. $\left(\frac{2}{3}\right)^2 =$ _____
13. $\frac{3}{2} \cdot \frac{2}{3} =$ _____
14. $\left(\frac{3}{1}\right)\left(\frac{1}{3}\right) =$ _____
15. $2 \cdot \frac{1}{4} =$ _____
16. $3 \times \frac{3}{4} =$ _____
17. $\frac{1}{3} \cdot \frac{3}{4} \cdot \frac{4}{5} =$ _____

Find the area of the rectangle or parallelogram.

18. $\frac{1}{2}$ ft, $\frac{1}{2}$ ft

Area = _____

19. $\frac{3}{10}$ cm, $\frac{1}{2}$ cm

Area = _____

20. $\frac{3}{8}$ in., $\frac{5}{8}$ in.

Area = _____

21. $\frac{2}{5}$ m, $\frac{3}{5}$ m

Area = _____

22. **OPEN-ENDED** Find three different pairs of fractions that have the same product.

$$\square \cdot \square = \square \qquad \square \cdot \square = \square \qquad \square \cdot \square = \square$$

Dividing Fractions

Key Concept and Vocabulary

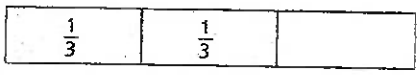
$$\frac{2}{3} \div \frac{1}{2} = \frac{2}{3} \cdot \frac{2}{1} = \frac{2 \cdot 2}{3 \cdot 1} = \frac{4}{3}$$

Invert and multiply.

Visual Model

There are 2 "one-thirds" in two-thirds.

$$\frac{2}{3} \div \frac{1}{3} = \frac{2}{3} \cdot \frac{3}{1} = 2$$



Skill Examples

1. $\frac{2}{5} \div \frac{1}{5} = \frac{2}{5} \cdot \frac{5}{1} = \frac{2 \cdot 5}{5 \cdot 1} = 2$
2. $\frac{2}{5} \div 5 = \frac{2}{5} \cdot \frac{1}{5} = \frac{2 \cdot 1}{5 \cdot 5} = \frac{2}{25}$
3. $\frac{9}{4} \div \frac{3}{4} = \frac{9}{4} \cdot \frac{4}{3} = \frac{9 \cdot 4}{4 \cdot 3} = 3$
4. $6 \div \frac{1}{2} = \frac{6}{1} \cdot \frac{2}{1} = \frac{6 \cdot 2}{1 \cdot 1} = 12$

Application Example

5. You drive 25 miles in one-half hour. What is your average rate?

$$25 \div \frac{1}{2} = \frac{25}{1} \cdot \frac{2}{1} = 50 \text{ mi/h} \qquad r = \frac{d}{t}$$

∴ Your average rate is 50 miles per hour.

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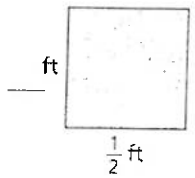
Check your answers at BigIdeasMath.com

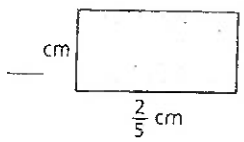
Find the quotient. Write your answer in simplified form.

6. $\frac{3}{5} \div \frac{1}{5} =$ _____
7. $4 \div \frac{1}{2} =$ _____
8. $\frac{2}{3} \div \frac{1}{6} =$ _____
9. $\frac{1}{6} \div \frac{2}{3} =$ _____
10. $\frac{2}{3} \div 2 =$ _____
11. $\frac{3}{4} \div 4 =$ _____
12. $\frac{3}{7} \div \frac{3}{7} =$ _____
13. $\frac{3}{7} \div \frac{7}{3} =$ _____
14. $5 \div \frac{1}{2} =$ _____
15. $\frac{9}{4} \div \frac{1}{4} =$ _____
16. $\frac{1}{4} \div \frac{1}{2} =$ _____
17. $\frac{3}{11} \div 11 =$ _____

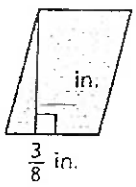
Find the height of the rectangle or parallelogram.

18. 

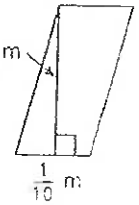
Area = $\frac{1}{4}$ ft^2

19. 

Area = $\frac{2}{25}$ cm^2

20. 

Area = $\frac{3}{16}$ in.^{2}

21. 

Area = $\frac{1}{50}$ m^2

22. **SPEED** You drive 15 miles in one-fourth hour. What is your average speed? _____

23. **MAGNETIC TAPE** A refrigerator magnet uses $\frac{5}{8}$ inch of magnetic tape. How many refrigerator magnets can you make with 10 inches of magnetic tape? Explain.

_____

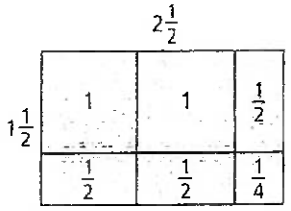
Multiplying Mixed Numbers

Key Concept and Vocabulary

$$2\frac{1}{2} \times 1\frac{1}{2} = \frac{5}{2} \times \frac{3}{2} = \frac{15}{4}$$

Rewrite as improper fractions.

Visual Model



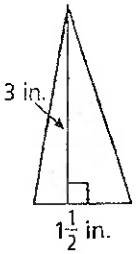
Area $= 2\frac{1}{2} \times 1\frac{1}{2} = \frac{15}{4} = 3\frac{3}{4}$

Skill Examples

1. $3\frac{1}{2} \times 2\frac{1}{3} = \frac{7}{2} \times \frac{7}{3} = \frac{49}{6} = 8\frac{1}{6}$
2. $1\frac{3}{4} \cdot 4\frac{1}{2} = \frac{7}{4} \cdot \frac{9}{2} = \frac{63}{8} = 7\frac{7}{8}$
3. $2\frac{2}{5} \times 1\frac{2}{3} = \frac{12}{5} \times \frac{5}{3} = \frac{60}{15} = 4$
4. $\left(1\frac{1}{2}\right)\left(1\frac{1}{2}\right) = \left(\frac{3}{2}\right)\left(\frac{3}{2}\right) = \frac{9}{4} = 2\frac{1}{4}$

Application Example

5. Find the area of the triangle.



$$\text{Area} = \frac{1}{2} \cdot 1\frac{1}{2} \cdot 3$$
$$= \frac{1}{2} \cdot \frac{3}{2} \cdot \frac{3}{1} = \frac{9}{4} = 2\frac{1}{4}$$

∴ The area is $2\frac{1}{4}$ square inches.

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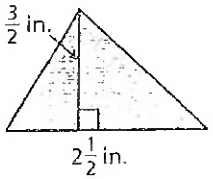
Check your answers at BigIdeasMath.com.

Find the product. Write your answer as a whole number or mixed number in simplified form.

6. $2\frac{1}{3} \times 1\frac{1}{3} =$ _____
7. $4\frac{2}{3} \times 1\frac{1}{2} =$ _____
8. $1\frac{1}{2} \times 3 =$ _____
9. $5\frac{1}{6} \times \frac{1}{3} =$ _____
10. $\frac{3}{4} \cdot 3\frac{1}{2} =$ _____
11. $5 \cdot 4\frac{1}{2} =$ _____
12. $2\frac{1}{7} \cdot \frac{7}{15} =$ _____
13. $1\frac{3}{5} \cdot \frac{3}{8} =$ _____
14. $\left(1\frac{1}{3}\right)^2 =$ _____
15. $\left(1\frac{1}{4}\right)^3 =$ _____
16. $\left(2\frac{1}{2}\right)\left(3\frac{1}{3}\right) =$ _____
17. $\left(3\frac{1}{2}\right)\left(\frac{1}{2}\right)^2 =$ _____

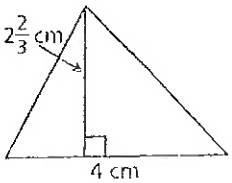
Find the area of the triangle.

18.



Area = _____

19.



Area = _____

20. **RECIPE** Rewrite the recipe so that each item is one-third of the full recipe.

$2\frac{1}{2}$ cups flour
2 tsp baking powder
4 Tbsp butter
$\frac{1}{2}$ tsp salt
$\frac{3}{4}$ cup milk

_____ cups flour

_____ tsp baking powder

_____ Tbsp butter

_____ tsp salt

_____ cup milk

Dividing Mixed Numbers

Key Concept and Vocabulary

Rewrite as improper fractions.

$$2\frac{1}{2} \div 5 = \frac{5}{2} \div \frac{5}{1}$$

$$= \frac{5}{2} \times \frac{1}{5}$$

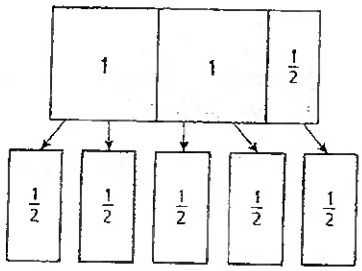
$$= \frac{1}{2}$$

Visual Model

Divide $2\frac{1}{2}$ into five equal parts.

Each part is $\frac{1}{2}$.

$$2\frac{1}{2} \div 5 = \frac{1}{2}$$



Skill Examples

1. $5 \div 2\frac{1}{2} = \frac{5}{1} \div \frac{5}{2} = \frac{5}{1} \times \frac{2}{5} = 2$
2. $3\frac{3}{4} \div 2\frac{1}{2} = \frac{15}{4} \div \frac{5}{2} = \frac{15}{4} \times \frac{2}{5} = \frac{3}{2} = 1\frac{1}{2}$
3. $4\frac{1}{6} \div 1\frac{2}{3} = \frac{25}{6} \div \frac{5}{3} = \frac{25}{6} \times \frac{3}{5} = \frac{5}{2} = 2\frac{1}{2}$
4. $7\frac{1}{3} \div 11 = \frac{22}{3} \div \frac{11}{1} = \frac{22}{3} \times \frac{1}{11} = \frac{2}{3}$

Application Example

5. You need $2\frac{1}{2}$ inches of ribbon to make a Blue-Ribbon award. How many awards can you make with 35 inches of ribbon?

$$35 \div 2\frac{1}{2} = \frac{35}{1} \div \frac{5}{2} = \frac{35}{1} \times \frac{2}{5} = 14$$

∴ You can make 14 awards.

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Check your answers at BigIdeasMath.com.

Find the quotient. Write your answer as a whole or mixed number in simplest form.

6. $4\frac{1}{2} \div 9 =$ _____
7. $3\frac{3}{7} \div 8 =$ _____
8. $4\frac{2}{3} \div 7 =$ _____
9. $1\frac{7}{9} \div 4 =$ _____
10. $8 \div 1\frac{1}{3} =$ _____
11. $32 \div 3\frac{1}{5} =$ _____
12. $11 \div 2\frac{3}{4} =$ _____
13. $9 \div 1\frac{1}{2} =$ _____
14. $5\frac{1}{2} \div \frac{1}{2} =$ _____
15. $\frac{1}{2} \div 1\frac{1}{2} =$ _____
16. $1\frac{1}{4} \div 1\frac{1}{4} =$ _____
17. $3\frac{1}{2} \div 1\frac{1}{3} =$ _____

Find the missing dimension.

18. $2\frac{1}{2}$ ft, Area = 10 ft²; ____ ft

19. ____ cm, Area = 16 cm²; $5\frac{1}{3}$ cm

20. **RED RIBBONS** You need $3\frac{1}{2}$ inches of ribbon to make a Red-Ribbon award. How many awards can you make with 35 inches of ribbon? _____

21. **SHIPPING** You are stacking books into a shipping box that is 15 inches high. Each book is $1\frac{1}{4}$ inches thick. How many books can you fit in a stack? _____

Rates

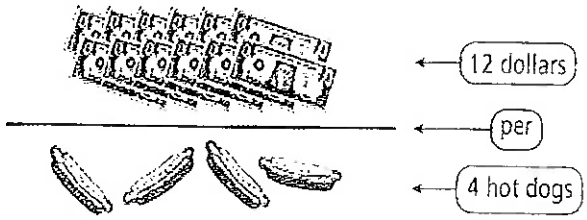
Key Concept and Vocabulary

You pay $12 for 4 hot dogs.

$$\text{Rate} = \frac{\$12}{4 \text{ hot dogs}}$$

$$\text{Unit Rate} = \frac{\$3}{1 \text{ hot dog}}$$

Visual Model



Skill Examples

1. You drive 100 miles in 2 hours.
   Your unit rate is 50 miles per hour.
2. You earn $40 in 5 hours.
   Your unit rate is $8 per hour.
3. You save $240 in 6 months.
   Your unit rate is $40 per month.

Application Example

4. Janice was 44 inches tall when she was 8 years old. She was 52 inches tall when she was 12 years old. What was her unit rate?

   She grew 8 inches in 4 years: $\frac{8}{4} = \frac{2}{1}$.

   ∴ Her unit rate is 2 inches per year.

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Check your answers at BigIdeasMath.com.

Write the unit rate in words and as a fraction for each situation.

5. You fly 2000 miles in 4 hours.

   _____ Words _____ Fraction

6. You pay 15 dollars for 3 pizzas.

   _____ Words _____ Fraction

7. You pay $4 sales tax on a $50 purchase.

   _____ Words _____ Fraction

8. You earn $25 for mowing 5 lawns.

   _____ Words _____ Fraction

Circle the name of the person with the greater unit rate.

9. Maria saves $50 in 4 months.
   Ralph saves $60 in 5 months.

10. John rides his bicycle 36 miles in 3 hours.
    Randy rides his bicycle 30 miles in 2.5 hours.

11. Kim earns $400 for working 40 hours.
    Sam earns $540 for working 45 hours.

12. Arlene scores 450 points on 5 tests.
    Jolene scores 180 points on 2 tests.

Convert the unit rate.

13. $\frac{60 \text{ miles}}{1 \text{ hour}} = \frac{\square \text{ feet}}{1 \text{ second}}$

14. $\frac{2 \text{ gallons}}{1 \text{ hour}} = \frac{\square \text{ cups}}{1 \text{ minute}}$

Proportions

Key Concept and Vocabulary

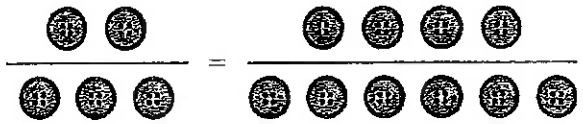
Proportion: "2 is to 3 as 4 is to 6."

$$\frac{2}{3} = \frac{4}{6}$$

$2 \cdot 6 = 3 \cdot 4$ ← Cross products are equal.

Visual Model

The ratio "2 to 3" is equal to the ratio "4 to 6."



Skill Examples

1. $\frac{3}{5} = \frac{12}{20}$ is a proportion because the cross products are equal.
2. $\frac{1}{7} = \frac{7}{48}$ is *not* a proportion because the cross products are not equal.
3. $\frac{10}{2} = \frac{5}{1}$ is a proportion because the cross products are equal.

Application Example

4. You spend \$5 for 3 tennis balls. Your friend spends \$6.25 for 4 tennis balls. Are the two rates proportional?

$$\frac{\$5}{3 \text{ balls}} \stackrel{?}{=} \frac{\$6.25}{4 \text{ balls}} \qquad 5(4) \neq 3(6.25)$$

∴ The rates are *not* proportional.

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Check your answers at BigIdeasMath.com.

Decide whether the statement is a proportion.

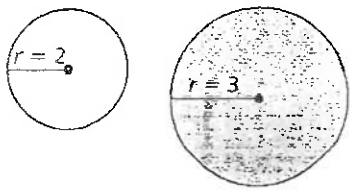
5. $\frac{3}{7} = \frac{6}{14}$ _____
6. $\frac{1}{4} = \frac{4}{1}$ _____
7. $\frac{3}{2} = \frac{9}{4}$ _____
8. $\frac{1.25}{3} = \frac{5}{12}$ _____
9. $\frac{6}{18} = \frac{120}{360}$ _____
10. $\frac{4}{5} = \frac{4+4}{5+5}$ _____

Complete the proportion.

11. $\frac{2}{5} = \frac{\square}{10}$
12. $\frac{1}{6} = \frac{4}{\square}$
13. $\frac{3}{\square} = \frac{9}{24}$

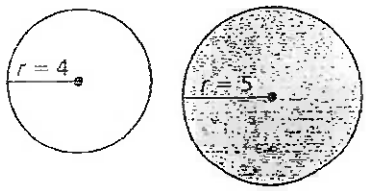
Write the proportion that compares the circumference to the radii of the two circles.

14.



_____

15.



_____

16. **COMPARING RATES** You spend \$20 for 5 T-shirts. Your friend spends \$15 for 3 T-shirts. Are the two rates proportional? _____

Fractions, Decimals, and Percents

- To write a percent as a decimal, divide by 100 and remove the percent symbol.
- To write a decimal as a percent, multiply by 100 and add the percent symbol.
- To express a fraction as a percent, you can use a proportion. Alternatively, you can write the fraction as a decimal, and then express the decimal as a percent.

EXAMPLE 1 **Write 56% as a decimal.**

$56\% = \underbrace{56}\,\%$ Divide by 100 and remove the percent symbol.

$= 0.56$

EXAMPLE 2 **Write 0.17 as a percent.**

$0.17 = 0.\underbrace{17}$ Multiply by 100 and add the percent symbol.

$= 17\%$

EXAMPLE 3 **Write $\frac{7}{20}$ as a percent.**

Method 1 Use a proportion.

$\frac{7}{20} = \frac{x}{100}$ Write the proportion.

$7 \cdot 100 = 20 \cdot x$ Find cross products.

$700 = 20x$ Multiply.

$\frac{700}{20} = \frac{20x}{20}$ Divide each side by 20.

$35 = x$ Simplify.

Method 2 Write as a decimal.

$\frac{7}{20} = 0.\underbrace{35}$ Convert to a decimal by dividing.

$= 35\%$ Multiply by 100 and add the percent symbol.

So, $\frac{7}{20}$ can be written as 35%.

EXERCISES

Write each percent as a decimal.

1. 10%
2. 36%
3. 82%
4. 49.1%

Write each decimal as a percent.

5. 0.14
6. 0.59
7. 0.932
8. 1.07

Write each fraction as a percent.

9. $\frac{3}{4}$
10. $\frac{7}{10}$
11. $\frac{9}{16}$
12. $\frac{1}{40}$

Finding the Percent of a Number

Key Concept and Vocabulary

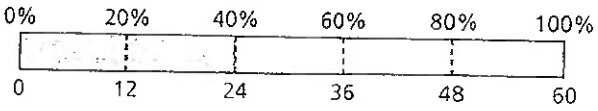
40% of 60 is 24.

$0.4 \times 60 = 24$

$\frac{2}{5} \times 60 = 24$

Write percent as decimal or fraction and multiply.

Visual Model



Skill Examples

1. 30% of 50: $0.3 \times 50 = 15$
2. 45% of 80: $0.45 \times 80 = 36$
3. 110% of 40: $1.1 \times 40 = 44$
4. 25% of 240: $0.25 \times 240 = 60$

Application Example

5. 28% of the 200 people who answered a survey own a dog. How many of the 200 people in the survey own a dog?

$0.28 \times 200 = 56$

∴ 56 of the 200 people own a dog.

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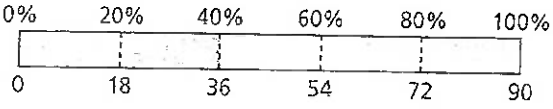
Check your answers at BigIdeasMath.com.

Find the percent of the number.

6. 25% of 40 = _____
7. 20% of 35 = _____
8. 65% of 110 = _____
9. 125% of 20 = _____
10. $33\frac{1}{3}$% of 60 = _____
11. 95% of 400 = _____
12. 200% of 31 = _____
13. 18% of 90 = _____
14. 1% of 800 = _____
15. 60% of 60 = _____
16. 100% of 59 = _____
17. 1000% of 59 = _____

Write the question represented by the model. Then answer the question.

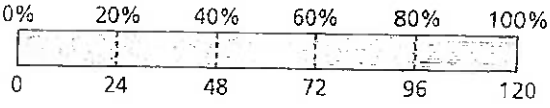
18.



Question: _____

Answer: _____

19.



Question: _____

Answer: _____

20. **ENDANGERED SPECIES** Sixty percent of a species of butterfly died due to loss of habitat. Originally, there were 10,000 butterflies. How many are left? _____

21. **SALES TAX** You buy 4 breakfast sandwiches at \$2.59 each, 4 hashbrowns at \$1.10 each, and 4 bottles of orange juice at \$1.25 each. The sales tax is 6%. Find the total cost of the 4 meals, including sales tax. _____

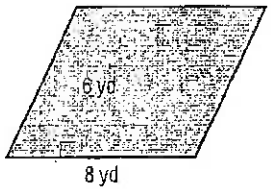
Area of Parallelograms, Triangles, and Trapezoids

The area A of a parallelogram is the product of any base b and its height h, or $A = bh$.

The area A of a triangle is half the product of any base b and its height h, or $A = \frac{1}{2}bh$.

The area A of a trapezoid is half the product of the height h and the sum of the bases, b_1 and b_2, or $A = \frac{1}{2}h(b_1 + b_2)$.

EXAMPLES **Find the area of each figure.**

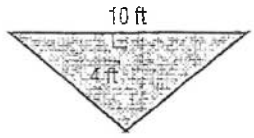


1. The base is 8 yards. The height is 6 yards.

$A = bh$ Area of a parallelogram

$A = 8 \cdot 6$ or 48 Replace b with 8 and h with 6. Multiply.

The area is 48 square yards.

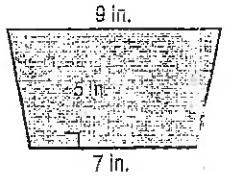


2. The base is 10 feet. The height is 4 feet.

$A = \frac{1}{2}bh$ Area of a triangle

$A = \frac{1}{2} \cdot 10 \cdot 4$ or 20 Replace b with 10 and h with 4. Multiply.

The area is 20 square feet.



3. The height is 5 inches. The lengths of the bases are 9 inches and 7 inches.

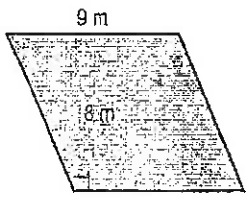
$A = \frac{1}{2}h(b_1 + b_2)$ Area of a trapezoid

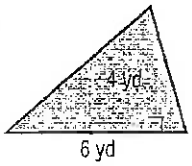
$A = \frac{1}{2} \cdot 5 \cdot (9 + 7)$ or 40 Replace h with 5, b_1 with 9, and b_2 with 7. Simplify.

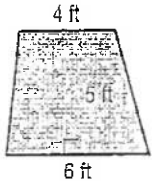
The area is 40 square inches.

EXERCISES

Find the area of each figure.

1. 

2. 

3. 

4. parallelogram: base, 11 cm; height, 12 cm

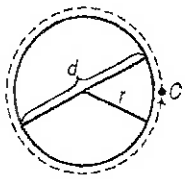
5. triangle: base, 8 mi; height, 13 mi

6. trapezoid: height, 7 km; bases, 8 km and 12 km

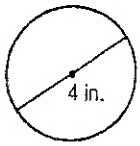
Circumference and Area of Circles

The **circumference** C of a circle is equal to its diameter d times π or 2 times the radius r times π, or $C = \pi d$ or $C = 2\pi r$.

The **area** A of a circle is equal to π times the square of the radius r, or $A = \pi r^2$.



EXAMPLES **Find the circumference of each circle.**

1. 

$C = \pi d$ Circumference of a circle
$C = \pi \cdot 4$ Replace d with 4.
$C \approx 12.6$ Use a calculator.

The circumference is about 12.6 inches.

2. 

$C = 2\pi r$ Circumference of a circle
$C = 2 \cdot \pi \cdot 5.4$ Replace r with 5.4.
$C \approx 33.9$ Use a calculator.

The circumference is about 33.9 meters.

EXAMPLE 3 **Find the area of the circle.**

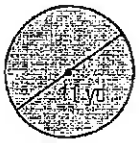
$A = \pi r^2$ Area of a circle
$A = \pi(1.5)^2$ Replace r with half of 3 or 1.5.
$A \approx 7.1$ Use a calculator.

The area is about 7.1 square feet.

EXERCISES

Find the circumference and area of each circle. Round to the nearest tenth.

1. 

2. 

3. 

4. The diameter is 9.3 meters.

5. The radius is 6.9 millimeter.

6. The diameter is 15.7 inches.

Plotting Points

Connect each of the following ordered points.

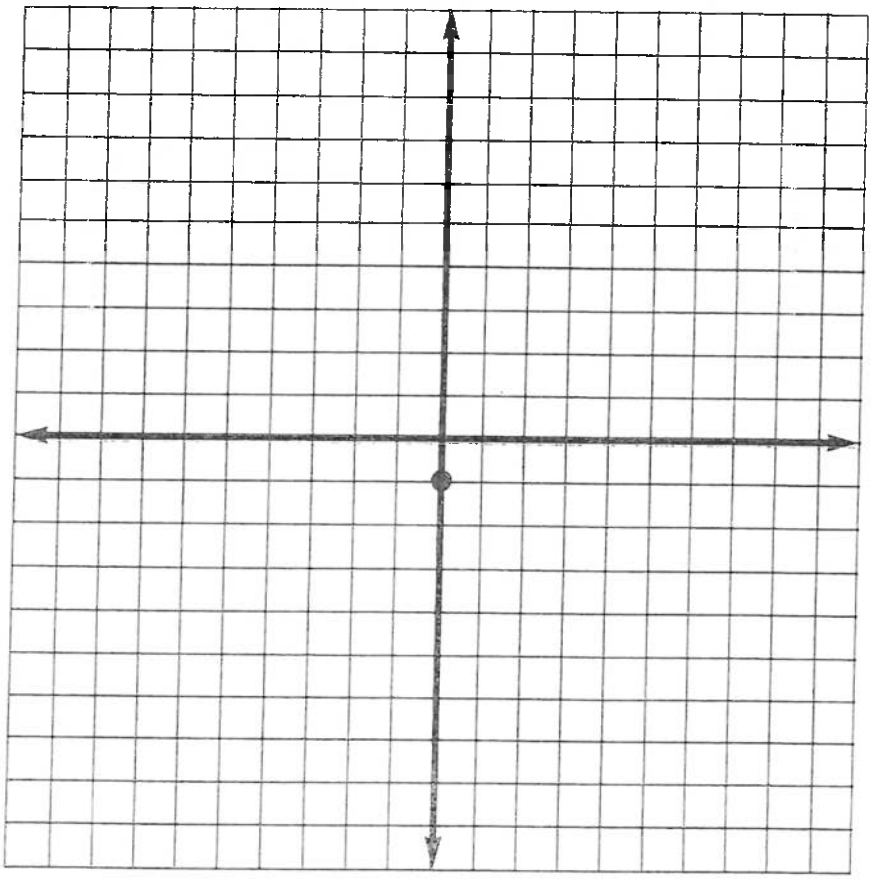
$(x, y) = (0, -1)$

- vertical move ⟹ down one
- horizontal move ⟹ no move

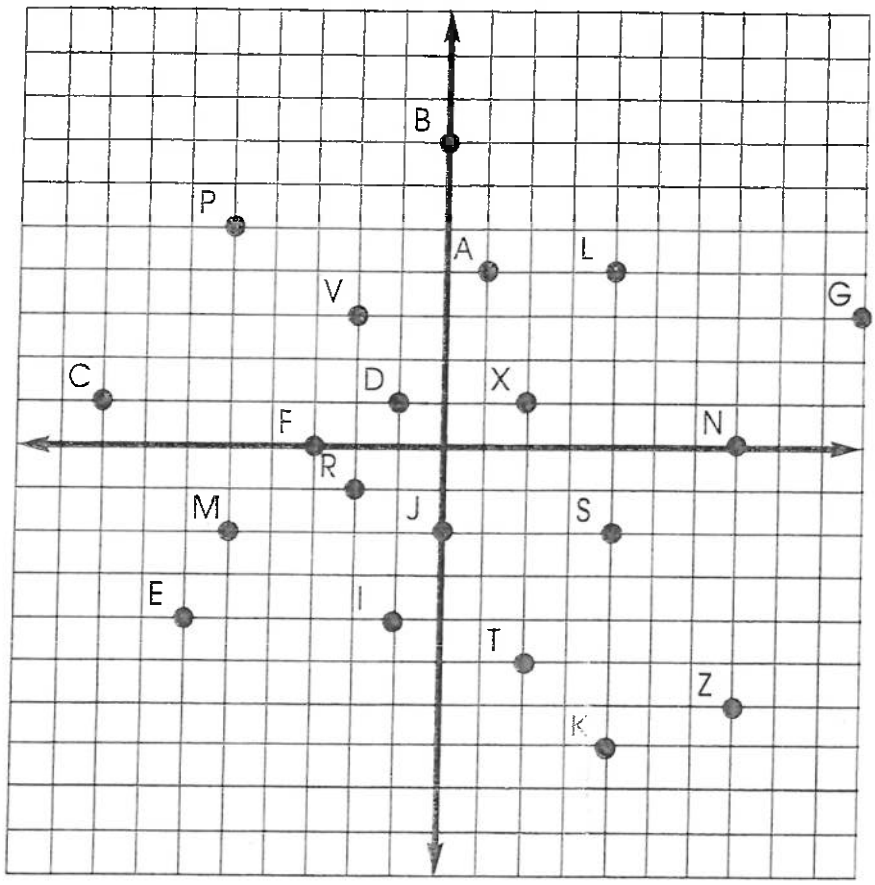
"Ancient History"

Start at (0, -1)

(1, -1)	(0, 3)
(1, -3)	(-1, 4)
(3, -3)	(-2, 3)
(3, -1)	(-3, 4)
(5,0)	(-4, 3)
(8,0)	(-5, 1)
(7,1)	(-8, 2)
(9,0)	(-5, 0)
(8,2)	(-3, -1)
(5,1)	(-3, -3)
(4,3)	(-1, -3)
(3,4)	(-1, -1)
(2,3)	(0, -1)
(1, 4)	End



Coordinates and Graphing



Find the coordinates associated with the following points.

1. A
2. K
3. E
4. P
5. T
6. C
7. B
8. S
9. D
10. N

Find the letter associated with each pair of coordinates.

11. (2, 1)
12. (⁻1, ⁻4)
13. (10, 3)
14. (7, ⁻6)
15. (⁻2, ⁻1)
16. (⁻2, 3)
17. (⁻3, 0)
18. (4, 4)
19. (⁻5, ⁻2)
20. (0, ⁻2)

The Coordinate Plane

The **coordinate plane** is used to locate points. The horizontal number line is the ***x*-axis**. The vertical number line is the ***y*-axis**. Their intersection is the **origin**.

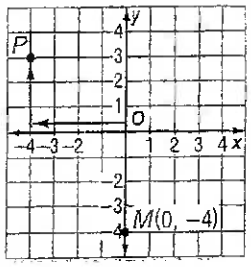
Points are located using **ordered pairs**. The first number in an ordered pair is the ***x*-coordinate**; the second number is the ***y*-coordinate**.

The coordinate plane is separated into four sections called **quadrants**.

EXAMPLE 1 **Name the ordered pair for point P. Then identify the quadrant in which P lies.**

- Start at the origin.
- Move 4 units left along the x-axis.
- Move 3 units up on the y-axis.

The ordered pair for point P is $(-4, 3)$.
P is in the upper left quadrant or quadrant II.

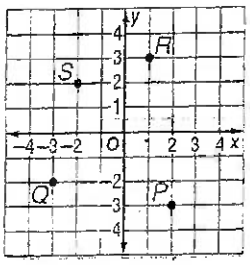


EXAMPLE 2 **Graph and label the point $M(0, -4)$.**

- Start at the origin.
- Move 0 units along the x-axis.
- Move 4 units down on the y-axis.
- Draw a dot and label it $M(0, -4)$.

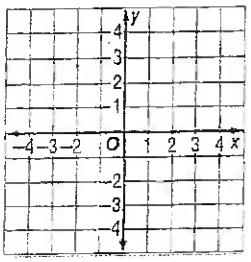
EXERCISES

Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.



1. P
2. Q
3. R
4. S

Graph and label each point on the coordinate plane.



5. $A(-1, 1)$
6. $B(0, -3)$
7. $C(3, 2)$
8. $D(-3, -1)$
9. $E(1, -2)$
10. $F(1, 3)$