

Dear Incoming 7th Grade Skinner Middle School Parents and Students,

In preparation for the 2017-2018 school year, each student entering 7th grade is required to complete a summer math review packet. This packet correlates to the Common Core State Standards and focuses on the prerequisite concepts and skills necessary for student success in math class. During the first day of school, students will turn in their packet for a grade. All students will have the opportunity to ask follow up questions. The packet will also be available for download at the Skinner Middle School website: <http://skinner.dpsk12.org>

While completing the packet, students must:

- **Show all work for every problem on additional sheets of paper. They must staple these papers to the back of the packet when they turn it in.**
- **Work must be shown for all problems; every problem must be answered.**

This packet is a summary of 6th grade standards. In seventh grade, students are expected to perform these tasks proficiently. Seventh grade standards build upon sixth grade standards. Students should ensure that their best work is reflected on this homework.

The packet is **DUE: The FIRST DAY OF SCHOOL, August 22nd, 2017.**

All incoming 7th grade students are expected to have multiplication facts memorized, fact families 1-12. An additional resource is www.multiplication.com or mathblaster.com for practice of multiplication and division facts. If you are having difficulties with a concept we suggest to visit khanacademy.com and/or youtube.com
Should you want more challenge, www.illustrativemathematics.org is a great site that offers challenging problems/tasks at all grade levels.

We are looking forward to having your student as members of the 2017-2018 7th grade Skinner family. Have a great summer, and we are looking forward to a great 2017-2018 year.

Sincerely,

Peter English
peter_english@dpsk12.org
7th Grade Math

Jessica Piwko
Jessica_piwko@dpsk12.org
Math Department Chair



REVIEW: Multiplying Fractions

Name _____


Key Concept and Vocabulary

Multiply numerators.

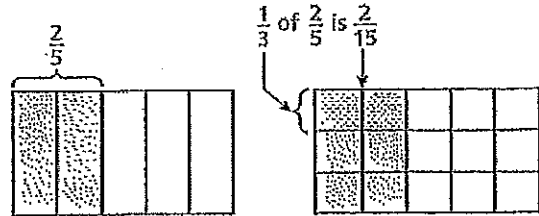
$$\frac{1}{3} \cdot \frac{2}{5} = \frac{1 \cdot 2}{3 \cdot 5} = \frac{2}{15}$$

Multiply denominators.

Multiply fractions.



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.

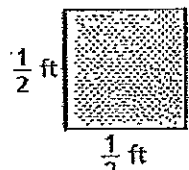
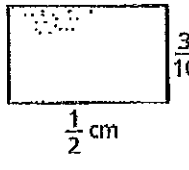
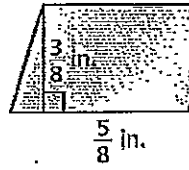
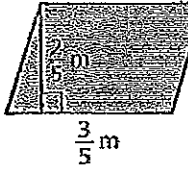
PRACTICE MAKES PURR-FECT™



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.

- | | | | |
|--|--|---|--|
| <p>18. </p> <p>Area = _____</p> | <p>19. </p> <p>Area = _____</p> | <p>20. </p> <p>Area = _____</p> | <p>21. </p> <p>Area = _____</p> |
|--|--|---|--|

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

$$\boxed{} \cdot \boxed{} = \boxed{} \quad \boxed{} \cdot \boxed{} = \boxed{} \quad \boxed{} \cdot \boxed{} = \boxed{}$$

REVIEW: Dividing Fractions

Name _____

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

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

Application Example

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

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

✦ Your average rate is 50 miles per hour.

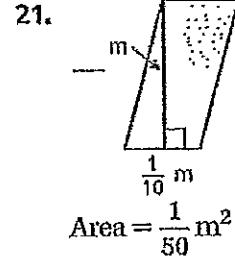
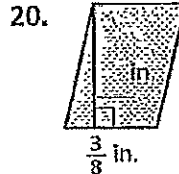
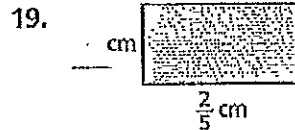
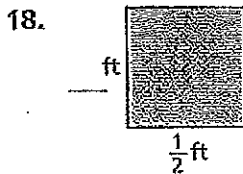
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Find the quotient. Write your answer in simplified form.

- $\frac{3}{5} \div \frac{1}{5} =$ _____
- $4 \div \frac{1}{2} =$ _____
- $\frac{2}{3} \div \frac{1}{6} =$ _____
- $\frac{1}{6} \div \frac{2}{3} =$ _____
- $\frac{2}{3} \div 2 =$ _____
- $\frac{3}{4} \div 4 =$ _____
- $\frac{3}{7} \div \frac{3}{7} =$ _____
- $\frac{3}{7} \div \frac{7}{3} =$ _____
- $5 \div \frac{1}{2} =$ _____
- $\frac{9}{4} \div \frac{1}{4} =$ _____
- $\frac{1}{4} \div \frac{1}{2} =$ _____
- $\frac{3}{11} \div 11 =$ _____

Find the height of the rectangle or parallelogram.



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

- 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.

REVIEW: Multiplying Mixed Numbers

Name _____

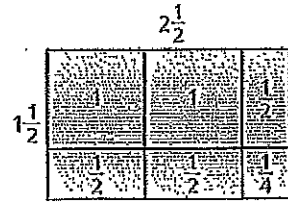
Key Concept and Vocabulary

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

↑ ↑
Rewrite as improper fractions.



Visual Model



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

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. $2\frac{2}{5} \times 1\frac{2}{3} = \frac{12}{5} \times \frac{5}{3} = \frac{60}{15} = 4$

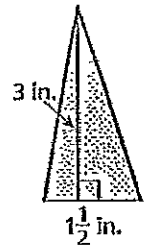
4. $\left(1\frac{1}{2}\right)\left(1\frac{1}{2}\right) = \left(\frac{3}{2}\right)\left(\frac{3}{2}\right) = \frac{9}{4} = 2\frac{1}{4}$

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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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. $1\frac{3}{5} \cdot \frac{3}{8} =$ _____

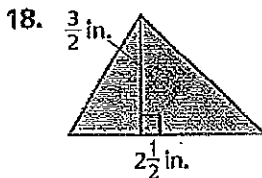
14. $\left(1\frac{1}{3}\right)^2 =$ _____

15. $\left(1\frac{1}{4}\right)^3 =$ _____

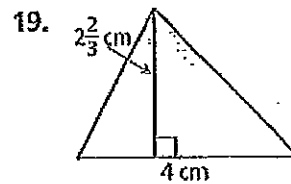
16. $\left(2\frac{1}{2}\right)\left(3\frac{1}{3}\right) =$ _____

17. $\left(3\frac{1}{2}\right)\left(\frac{1}{2}\right)^2 =$ _____

Find the area of the triangle.



Area = _____



Area = _____

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

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

_____ cups flour

_____ tsp salt

_____ tsp baking powder

_____ cup milk

_____ Tbsp butter

REVIEW: Dividing Mixed Numbers

Name _____

Key Concept and Vocabulary

Rewrite as improper fractions.

$$\begin{aligned} 2\frac{1}{2} \div 5 &= \frac{5}{2} \div \frac{5}{1} \\ &= \frac{5}{2} \times \frac{1}{5} \\ &= \frac{1}{2} \end{aligned}$$

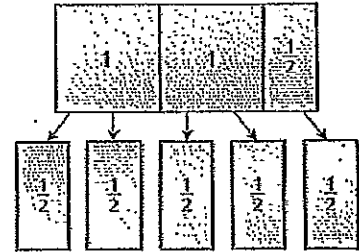


Visual Model

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

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

Application Example

- 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 _____

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

- $4\frac{1}{2} \div 9 = \underline{\hspace{2cm}}$
- $3\frac{3}{7} \div 8 = \underline{\hspace{2cm}}$
- $4\frac{2}{3} \div 7 = \underline{\hspace{2cm}}$
- $1\frac{7}{9} \div 4 = \underline{\hspace{2cm}}$
- $8 \div 1\frac{1}{3} = \underline{\hspace{2cm}}$
- $32 \div 3\frac{1}{5} = \underline{\hspace{2cm}}$
- $11 \div 2\frac{3}{4} = \underline{\hspace{2cm}}$
- $9 \div 1\frac{1}{2} = \underline{\hspace{2cm}}$
- $5\frac{1}{2} \div \frac{1}{2} = \underline{\hspace{2cm}}$
- $\frac{1}{2} \div 1\frac{1}{2} = \underline{\hspace{2cm}}$
- $1\frac{1}{4} \div 1\frac{1}{4} = \underline{\hspace{2cm}}$
- $3\frac{1}{2} \div 1\frac{1}{3} = \underline{\hspace{2cm}}$

Find the missing dimension.

18. $2\frac{1}{2}$ ft Area = 10 ft²
_____ ft

19. _____ cm Area = 16 cm²
 $5\frac{1}{3}$ cm

- 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? _____
- 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? _____

REVIEW: Finding the Percent of a Number

Name _____

Key Concept and Vocabulary

40% of 60 is 24.

$$\downarrow \quad \downarrow$$

$$0.4 \times 60 = 24$$

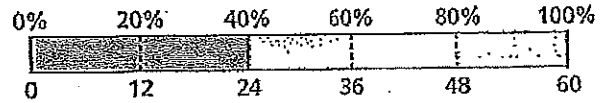
$$\frac{2}{5} \times 60 = 24$$

Write percent as decimal or fraction and multiply.

Finding a part.



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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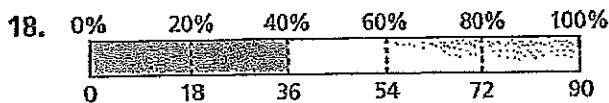


Check your answers at _____

Find the percent of the number.

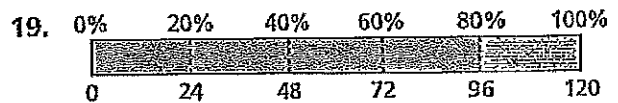
6. 25% of 40 = _____
7. 20% of 35 = _____
8. 65% of 110 = _____
9. 125% of 20 = _____
10. $33\frac{1}{3}\%$ of 60 = _____
11. 95% of 400 = _____
12. 200% of 31 = _____
13. 18% of 90 = _____
14. 1% of 800 = _____
15. 60% of 60 = _____
16. 100% of 59 = _____
17. 1000% of 59 = _____

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



Question: _____

Answer: _____



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. _____

REVIEW: Rates

Name _____

Key Concept and Vocabulary

You pay \$12 for 4 hot dogs.



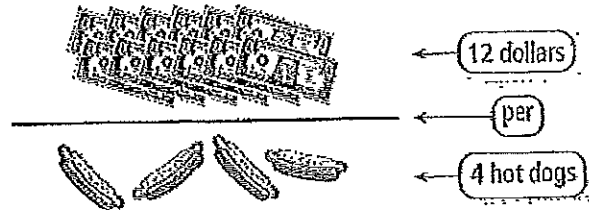
Rates



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

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

Visual Model



Skill Examples

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

Application Example

- 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

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.

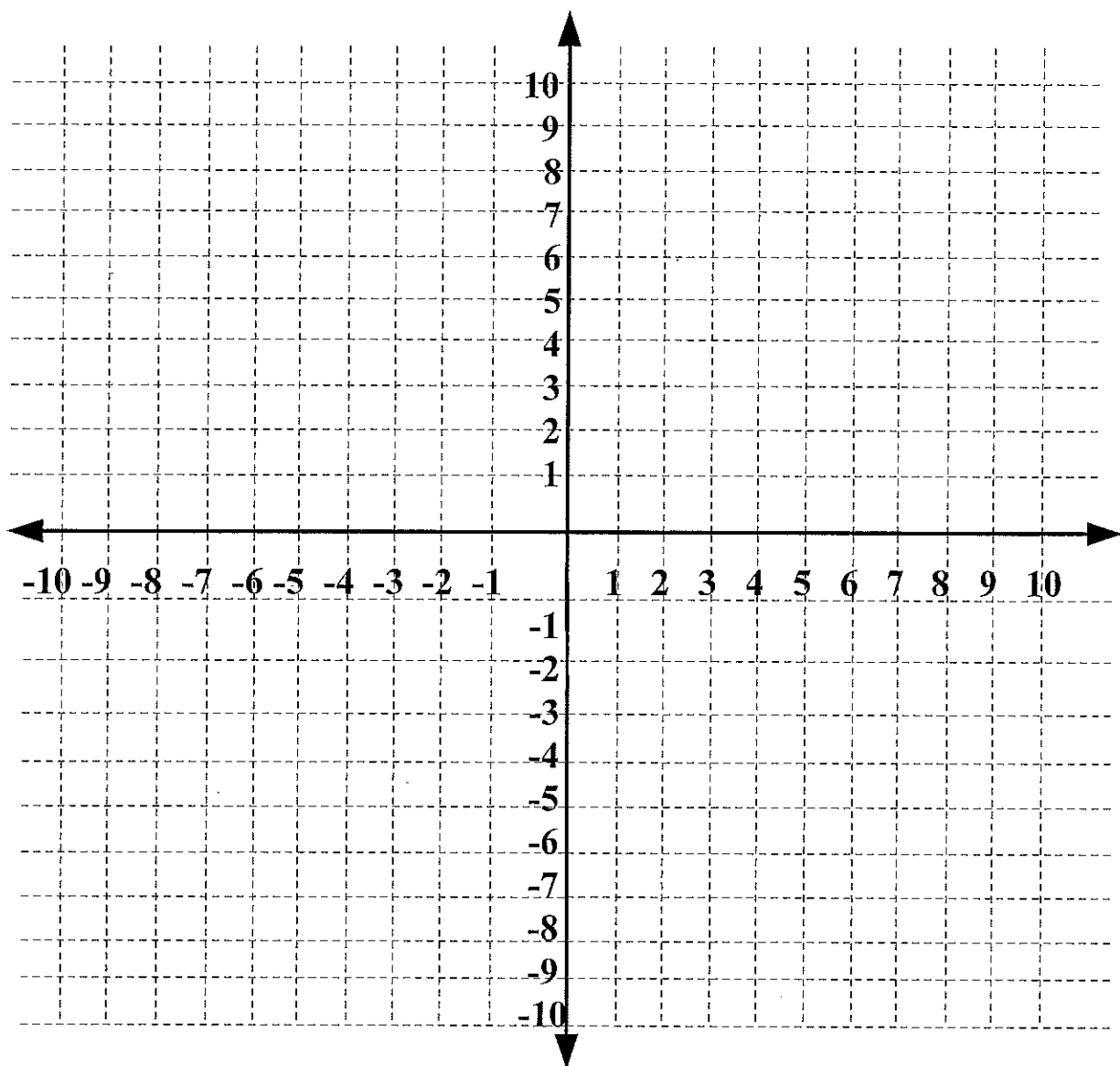
12. Arlene scores 450 points on 5 tests.
Jolene scores 180 points on 2 tests.

Convert the unit rate.

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

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

Plotting Ordered Pairs



Plot the ordered pairs below in the graph above to reveal a letter.

- | | | | | |
|---------------|---------------|----------------|---------------|----------------|
| 1.) (3 , -6) | 2.) (-7 , 0) | 3.) (-4 , 8) | 4.) (9 , 0) | 5.) (4 , 9) |
| 6.) (-7 , 3) | 7.) (0 , 9) | 8.) (7 , 7) | 9.) (-6 , -2) | 10.) (0 , -6) |
| 11.) (6 , -5) | 12.) (-5 , 7) | 13.) (-4 , -5) | 14.) (9 , -1) | 15.) (3 , 1) |
| 16.) (8 , -3) | 17.) (9 , 1) | 18.) (8 , 5) | 19.) (7 , 1) | 20.) (-2 , -6) |

Evaluate Expressions Homework

Name: _____

If $x = 9$ $y = 5$

1. $3 + y$

2. $y + 8$

3. $4y$

4. $y^2 + x$

5. $300y$

6. $x^2 - 2y$

7. $2y + 3 \cdot x$

8. $10y - x$

9. $2xy$

Evaluate Expressions Warm-up

Name: _____

If $a = 2$, $b = 6$

1. ab

2. $\frac{4b}{2}$

3. $\frac{2b - a}{5a}$

4. $3b - 4a$

5. $a^3 + 2b$

6. $b^2 \div (4 + a)$

7. $\frac{8b}{a+4}$

8. $5b - a \cdot 4$

9. $7 - b \div 2$

Algebraic Equations

Write out an algebraic equation for each sentence.

- 1.) Three more than twice a number is eleven.
- 2.) Five times a number decreased by three is seven.
- 3.) Fifteen is ten increased by a number.

Complete the following algebraic equations.

- 1.) $3X + 10 = 22$
- 2.) $24 - 4X = 4$
- 3.) $5 - 2X + 17 = 18$

Complete the following word problems using an algebraic equation.

- 1.) Tanya wants to make an apple pie and has 5 apples. She needs 12 apples to finish the pie. How many more apples does she need?
- 2.) Steven wants to buy a game for \$34.00. He has saved up \$20.00. How much more money does he need to buy the game?
- 3.) Sarah is selling lemonade. She has sold a total of 14 cups. 4 cups were sold to adults and she sold 2 batches of lemonade to other children. How many cups were in each batch?

Select the correct answer(s) from the given options:

5. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$5(6x - 4)$$

- a) $30x - 9$
- b) $6x - 4$
- c) $30x - 20$
- d) $30x - 4$

Answer: _____

6. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$15 - 21p$$

- a) $5(3 - 7p)$
- b) $3(5 - 7p)$
- c) $15(5 - 7p)$
- d) $3(5 - 21p)$

Answer: _____

7. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$r + 3 + 5r + 9$$

- a) $4r + 12$
- b) $6(r + 2)$
- c) $6r + 9$
- d) $3(2r + 3)$

Answer: _____

8. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$3m + 12$$

- a) $3(m + 4)$
- b) $3(m + 3)$

Answer: _____

9. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$6k + 14$$

- a) $3(2k + 7)$
- b) $2(3k + 7)$

Answer: _____

10. Use the distributive property of operations and choose the correct equivalent expression for the given expression.

$$8k - 8 + 3k - 14$$

- a) $11k - 6$
- b) $5k - 6$
- c) $11(k - 2)$
- d) $11(k + 2)$

Answer: _____

