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Reteaching 5-1 Comparing and Ordering Rational Numbers

Compare $\frac{2}{27}$ and $\frac{1}{18}$. Also compare $-\frac{2}{27}$ and $-\frac{1}{18}$.

Step 1: Find the LCM of 27 and 18.

$27 = 3^3$ and $18 = 2 \cdot 3^2$

$\text{LCM} = 2 \cdot 3^3 = 54$

Step 2: Write equivalent fractions with a denominator of 54.

$\frac{2 \cdot 2}{27 \cdot 2} = \frac{4}{54}$

$\frac{1 \cdot 3}{18 \cdot 3} = \frac{3}{54}$

Step 3: Compare the fractions.

$4 > 3$, so

$\frac{4}{54} > \frac{3}{54}$ or $\frac{2}{27} > \frac{1}{18}$.

Since $-4 < -3$,

$-\frac{4}{54} < -\frac{3}{54}$ or $-\frac{2}{27} < -\frac{1}{18}$.

Find the LCD of each pair of fractions. Write equivalent fractions using the LCD and compare. Use >, <, or = to complete each statement.

1. $\frac{2}{9}, \frac{1}{6}$

_____ ☐ _____

2. $\frac{5}{8}, \frac{3}{4}$

_____ ☐ _____

3. $-\frac{2}{3}, -\frac{5}{6}$

_____ ☐ _____

4. $-\frac{5}{18}, -\frac{2}{9}$

_____ ☐ _____

5. $\frac{7}{12}, \frac{11}{18}$

_____ ☐ _____

6. $\frac{13}{20}, \frac{11}{15}$

_____ ☐ _____

7. $-\frac{11}{20}, -\frac{22}{40}$

_____ ☐ _____

8. $\frac{6}{25}, \frac{1}{5}$

_____ ☐ _____

9. $\frac{15}{28}, \frac{4}{7}$

_____ ☐ _____

10. $\frac{5}{9}, \frac{11}{21}$

_____ ☐ _____

11. $\frac{5}{17}, \frac{15}{51}$

_____ ☐ _____

12. $-\frac{5}{12}, -\frac{13}{30}$

_____ ☐ _____

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Practice 5-1 Comparing and Ordering Fractions

Compare. Use >, <, or = to complete each statement.

1. $\frac{2}{3} \square \frac{7}{9}$
2. $\frac{3}{5} \square \frac{7}{10}$
3. $-\frac{3}{4} \square -\frac{13}{16}$
4. $\frac{9}{21} \square \frac{6}{14}$
5. $-\frac{2}{8} \square -\frac{7}{32}$
6. $\frac{7}{9} \square -\frac{8}{9}$
7. $\frac{5}{8} \square \frac{7}{12}$
8. $-\frac{4}{5} \square -\frac{7}{8}$
9. $-\frac{4}{18} \square -\frac{6}{27}$
10. $\frac{8}{17} \square -\frac{3}{8}$
11. $\frac{4}{7} \square 2\frac{4}{7}$
12. $\frac{-9}{-11} \square \frac{9}{11}$
13. $\frac{1}{3} \square -\frac{3}{9}$
14. $-\frac{12}{6} \square -\frac{9}{3}$
15. $-\frac{5}{10} \square \frac{-3}{-4}$

Find the LCM of each group of numbers or expressions.

16. $7, 21$ _____
17. $24, 32$ _____
18. $15, 50$ _____
19. $9a^3b, 18abc$ _____
20. $28xy^2, 42x^2y$ _____
21. $9, 12, 16$ _____

22. A quality control inspector in an egg factory checks every forty-eighth egg for cracks and every fifty-fourth egg for weight. What is the number of the first egg each day that the inspector checks for both qualities?

_____

23. A stock sold for $3\frac{5}{8}$ one day and $3\frac{1}{2}$ the next. Did the value of the stock go up or down? Explain.

_____

24. Marissa needs $2\frac{2}{3}$ yards of ribbon for a wall-hanging she wants to make. She has $2\frac{3}{4}$ yards. Does she have enough ribbon? Explain.

_____

Order from least to greatest.

25. $\frac{2}{3}, \frac{3}{4}, \frac{1}{2}$ _____
26. $\frac{2}{5}, \frac{1}{3}, \frac{3}{7}, \frac{4}{9}$ _____
27. $\frac{8}{11}, \frac{9}{10}, \frac{7}{8}, \frac{3}{4}$ _____

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Reteaching 5-2 Fractions and Decimals

Write $1.5\overline{3}$ as a mixed number in simplest form.

$n = 1.533333\ldots$	Let the variable n equal the decimal. Note that the bar is over only the 3, so only the 3 repeats.
$100n = 153.3333\ldots$	Multiply each side by 10^2 or 100 to bring one of the repeating 3's left of the decimal.
$10n = 15.3333\ldots$	Multiply each side by 10 so the repeating 3's will subtract out.
$100n = 153.3333\ldots$	Subtract to eliminate the repeating 3's.
$-\ 10n = -\ 15.3333\ldots$	
$90n = 138$	Solve the new equation
$\frac{90n}{90} = \frac{138}{90}$	Divide each side by 90.
$n = 1\frac{48}{90}$	
$n = 1\frac{48 \div 6}{90 \div 6}$	Divide the numerator and denominator by the GCF, 6.
$= 1\frac{8}{15}$	

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

1. $0.\overline{63}$

$n =$ _____

$100n =$ _____

$-\ n =$ _____

$99n =$ _____

$\frac{99n}{99} =$ _____

$n =$ _____

2. $0.8\overline{3}$

$n =$ _____

$100n =$ _____

$-\ 10n =$ _____

$90n =$ _____

$\frac{90n}{90} =$ _____

$n =$ _____

3. $1.7\overline{2}$ _____

4. $0.\overline{57}$ _____

5. $4.\overline{90}$ _____

6. $2.2\overline{6}$ _____

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Practice 5-2 Fractions and Decimals

Write as a fraction or mixed number in simplest form.

1. 0.4 _____
2. 0.75 _____
3. 0.16 _____
4. 2.34 _____
5. 0.09 _____
6. 8.8 _____

Write each fraction or mixed number as a decimal.

7. $\frac{17}{20}$ _____
8. $\frac{7}{8}$ _____
9. $-\frac{9}{16}$ _____
10. $3\frac{1}{8}$ _____
11. $6\frac{9}{32}$ _____
12. $2\frac{87}{125}$ _____
13. $\frac{13}{25}$ _____
14. $4\frac{31}{50}$ _____
15. $-\frac{7}{12}$ _____
16. $\frac{4}{9}$ _____
17. $\frac{5}{18}$ _____
18. $\frac{15}{11}$ _____

Order from least to greatest.

19. $0.4, \frac{3}{5}, \frac{1}{2}, \frac{3}{10}$ _____

20. $-\frac{3}{8}, -\frac{3}{4}, -0.38, -0.6$ _____

21. $\frac{1}{4}, -\frac{1}{5}, 0.2, \frac{2}{5}$ _____

22. Write an improper fraction with the greatest possible value using each of the digits 5, 7, and 9 once. Write this as a mixed number and as a decimal.

_____

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

23. $10.0\overline{7}$ _____
24. 3.44 _____
25. $-4.\overline{27}$ _____
26. 0.09 _____
27. 0.375 _____
28. $0.2\overline{43}$ _____

Compare. Use <, >, or = to complete each statement.

29. $\frac{5}{6}$ ☐ 0.8
30. $\frac{7}{11}$ ☐ 0.65
31. $4.\overline{2}$ ☐ $4\frac{2}{9}$
32. $-\frac{3}{11}$ ☐ -0.25
33. $0.\overline{80}$ ☐ $\frac{80}{99}$
34. -0.43 ☐ $-\frac{7}{16}$

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Reteaching 5-3 Adding and Subtracting Fractions

Subtract $3\frac{1}{3} - 1\frac{5}{6}$.

Find a common denominator.

$3\frac{1}{3} = \quad 3\frac{2}{6} =$

$-\ 1\frac{5}{6} = \quad -\ 1\frac{5}{6} =$

Rename $3\frac{2}{6}$ and subtract.

$2\frac{8}{6}$

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

$1\frac{3}{6} = 1\frac{1}{2}$ Simplify.

Note: $3\frac{2}{6} = 2 + 1 + \frac{2}{6} = 2 + \frac{6}{6} + \frac{2}{6} = 2 + \frac{8}{6} = 2\frac{8}{6}$

Find each difference.

1. $2\frac{4}{5} = 2$

$-\ 1\frac{1}{10} = -\ 1$

_____

2. $4\frac{2}{3} = 4\frac{\square}{\square} = 3\frac{\square}{\square}$

$-\ 2\frac{11}{12} = -\ 2\frac{\square}{\square} = -\ 2\frac{\square}{\square}$

_____

3. $5\frac{1}{9} = 5\frac{\square}{\square} = 4\frac{\square}{\square}$

$-\ 2\frac{5}{6} = -\ 2\frac{\square}{\square} = 2\frac{\square}{\square}$

_____

4. $7\frac{2}{15} = 7\frac{\square}{\square} = 6\frac{\square}{\square}$

$-\ 1\frac{7}{10} = -\ 1\frac{\square}{\square} = -\ 1\frac{\square}{\square}$

_____

5. $3\frac{4}{9} - 2\frac{1}{18}$ _____

6. $6\frac{1}{3} - 2\frac{2}{5}$ _____

7. $7\frac{2}{7} - 3\frac{5}{6}$ _____

8. $2\frac{7}{18} - 1\frac{3}{4}$ _____

9. $10\frac{3}{7} - 5\frac{1}{14}$ _____

10. $1\frac{5}{8} - 1\frac{1}{6}$ _____

11. $2\frac{1}{5} - 1\frac{4}{9}$ _____

12. $11\frac{3}{5} - 9\frac{17}{20}$ _____

13. $5\frac{5}{36} - 4\frac{8}{9}$ _____

14. $3\frac{2}{9} - 3\frac{2}{3}$ _____

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Practice 5-3 Adding and Subtracting Fractions

Find each sum or difference.

1. $\frac{2}{3} + \frac{1}{6}$ _____
2. $\frac{5}{8} - \frac{1}{4}$ _____
3. $2 - \frac{5}{7}$ _____
4. $1\frac{1}{2} - 2\frac{4}{5}$ _____
5. $\frac{1}{4} - \frac{1}{3}$ _____
6. $5\frac{7}{8} + 3\frac{5}{12}$ _____
7. $\frac{x}{3} + \frac{x}{5}$ _____
8. $\frac{2n}{5} + \left(-\frac{n}{6}\right)$ _____
9. $\frac{7}{12} - \frac{3}{12}$ _____
10. $3\frac{1}{5} + 2\frac{2}{5}$ _____
11. $1\frac{5}{8} - 1\frac{1}{8}$ _____
12. $\frac{3}{5y} + \frac{1}{5y}$ _____
13. $\frac{9}{16} + \frac{3}{4}$ _____
14. $2\frac{7}{10} - 3\frac{7}{20}$ _____
15. $3\frac{5}{6} + 2\frac{3}{4}$ _____
16. $-1\frac{2}{3} + \left(-2\frac{1}{4}\right)$ _____

Find each sum using mental math.

17. $3\frac{3}{8} + 2\frac{1}{8} + 1\frac{3}{8}$ _____
18. $6\frac{7}{12} + 4\frac{5}{12}$ _____
19. $8\frac{3}{16} + 2\frac{5}{16} + 4\frac{7}{16}$ _____
20. $7\frac{9}{10} + 3\frac{3}{10}$ _____

Estimate each sum or difference.

21. $13\frac{4}{5} - 2\frac{9}{10}$ _____
22. $18\frac{3}{8} + 11\frac{6}{7}$ _____
23. $23\frac{6}{13} + 32\frac{7}{8}$ _____
24. $26\frac{9}{10} + 72\frac{5}{6}$ _____

Use prime factors to simplify each expression.

25. $\frac{7}{30} - \frac{29}{75}$ _____
26. $\frac{3}{14} + \frac{17}{63}$ _____
27. $\frac{5}{42} + \frac{5}{12}$ _____
28. $2\frac{5}{6} - 2\frac{5}{22}$ _____
29. $4\frac{4}{15} + 2\frac{4}{39}$ _____
30. $3\frac{5}{9} - 2\frac{11}{12}$ _____

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Reteaching 5-4 Multiplying and Dividing Fractions

Find $3\frac{2}{3} \cdot 1\frac{4}{5}$.

$3\frac{2}{3} \cdot 1\frac{4}{5} = \frac{11}{3} \cdot \frac{9}{5}$ Change to improper fractions.

$= \frac{11}{\cancel{3}_{1}} \cdot \frac{\overset{3}{\cancel{9}}}{5}$ Divide the common factors.

$= \frac{33}{5} = 6\frac{3}{5}$ Simplify.

Find $-1\frac{1}{2} \div 2\frac{1}{4}$.

$-1\frac{1}{2} \div 2\frac{1}{4} = -\frac{3}{2} \div \frac{9}{4}$ Change to improper fractions.

$= -\frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}}} \cdot \frac{\overset{2}{\cancel{4}}}{\underset{3}{\cancel{9}}}$ Multiply by the reciprocal.

$= -\frac{1}{1} \cdot \frac{2}{3}$ Divide the common factors.

$= -\frac{2}{3}$ Simplify.

Check your sign with the original problem. A negative times a positive has a negative product.

Find each product.

1. $\frac{7}{9} \cdot \frac{3}{7} =$ _____

2. $2\frac{1}{5} \cdot \left(-1\frac{1}{11}\right) =$ _____

3. $-3\frac{7}{8} \cdot 2\frac{2}{3} =$ _____

4. $5\frac{1}{7} \cdot 4\frac{2}{3} =$ _____

Find each quotient.

5. $-\frac{6}{11} \div \frac{4}{11} =$ _____

6. $1\frac{1}{6} \div 2\frac{1}{3} =$ _____

7. $-4\frac{1}{5} \div \left(-1\frac{3}{4}\right) =$ _____

8. $-6\frac{1}{8} \div \frac{7}{3} =$ _____

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Practice 5-4 Multiplying and Dividing Fractions

Find each quotient.

1. $\frac{1}{2} \div \frac{5}{8}$ _____

2. $-\frac{5}{24} \div \frac{7}{12}$ _____

3. $\frac{3}{8} \div \frac{6}{7}$ _____

4. $\frac{15}{19} \div \frac{15}{19}$ _____

5. $8 \div \frac{4}{5}$ _____

6. $6\frac{1}{4} \div 2\frac{1}{2}$ _____

7. $5\frac{5}{8} \div 1\frac{1}{4}$ _____

8. $2\frac{1}{3} \div \frac{7}{10}$ _____

9. $\frac{6}{35t} \div \frac{3}{7t}$ _____

10. $1\frac{3}{7} \div \left(-2\frac{1}{7}\right)$ _____

Find each product.

11. $\frac{2}{5} \cdot \frac{3}{7}$ _____

12. $\frac{5}{9} \cdot \frac{3}{5}$ _____

13. $\frac{7}{9} \cdot \frac{6}{13}$ _____

14. $\frac{5}{6} \cdot \left(-1\frac{3}{10}\right)$ _____

15. $-4\frac{2}{3}\left(-5\frac{1}{6}\right)$ _____

16. $2\frac{5}{6}\left(-\frac{2}{5}\right)$ _____

17. $4\frac{7}{8} \cdot 6$ _____

18. $\frac{5x}{7} \cdot \frac{3}{10}$ _____

19. $\frac{9a}{10} \cdot \frac{5}{12a}$ _____

20. $\frac{9t}{16} \cdot \frac{12}{17}$ _____

21. You are making cookies for a bake sale. The recipe calls for $2\frac{3}{4}$ cups of flour. How much flour will you need if you triple the recipe?

_____

22. It took you 1 hour to read $1\frac{3}{8}$ chapters of a novel. At this rate, how many chapters can you read in three hours?

_____

23. A teacher wants to tape sheets of paper together to make a science banner. He wants the banner to be $127\frac{1}{2}$ inches long, and each sheet of paper is $8\frac{1}{2}$ inches wide. How many sheets of paper will he need?

_____

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Practice 5-7 Solving Equations by Adding or Subtracting Fractions

Solve each equation.

1. $m - \left(-\frac{7}{10}\right) = -1\frac{1}{5}$ _____

2. $k - \frac{3}{4} = \frac{2}{5}$ _____

3. $x - \frac{5}{6} = \frac{1}{10}$ _____

4. $t - \left(-3\frac{1}{6}\right) = 7\frac{2}{3}$ _____

5. $x + \frac{5}{8} = \frac{7}{8}$ _____

6. $k + \frac{4}{5} = 1\frac{3}{5}$ _____

7. $4 = \frac{4}{9} + y$ _____

8. $h + \left(-\frac{5}{8}\right) = -\frac{5}{12}$ _____

9. $n + \frac{2}{3} = \frac{1}{9}$ _____

10. $e - \frac{11}{16} = -\frac{7}{8}$ _____

11. $w - 14\frac{1}{12} = -2\frac{3}{4}$ _____

12. $v + \left(-4\frac{5}{6}\right) = 2\frac{1}{3}$ _____

13. $a - 9\frac{1}{6} = -3\frac{19}{24}$ _____

14. $f + \left|-3\frac{11}{12}\right| = 18$ _____

15. $z + \left(-3\frac{2}{5}\right) = -4\frac{1}{10}$ _____

16. $x - \frac{7}{15} = \frac{7}{60}$ _____

17. $h - \left(-6\frac{1}{2}\right) = 14\frac{1}{4}$ _____

18. $p - 5\frac{3}{8} = -\frac{11}{24}$ _____

Solve each equation using mental math.

19. $x + \frac{3}{7} = \frac{5}{7}$ _____

20. $k - \frac{8}{9} = -\frac{1}{9}$ _____

21. $a + \frac{1}{9} = \frac{3}{9}$ _____

22. $g - \frac{4}{5} = -\frac{2}{5}$ _____

Write an equation to solve each problem.

23. Pete's papaya tree grew $3\frac{7}{12}$ ft during the year. If its height at the end of the year was $21\frac{1}{6}$ ft, what was its height at the beginning of the year?

_____

24. Lee is $1\frac{3}{4}$ ft taller than Jay. If Lee is $6\frac{1}{4}$ ft tall, how tall is Jay?

_____

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Reteaching 5-7 Solving Equations by Adding or Subtracting Fractions

Solve $h - 2\frac{3}{4} = -3\frac{1}{6}$.

$$h - 2\tfrac{3}{4} = -3\tfrac{1}{6}$$

$h - 2\frac{3}{4} + 2\frac{3}{4} = -3\frac{1}{6} + 2\frac{3}{4}$ Add $2\frac{3}{4}$ to each side.

$h = -3\frac{2}{12} + 2\frac{9}{12}$ Use a common denominator.

$h = -2\frac{14}{12} + 2\frac{9}{12}$ Rename $-3\frac{2}{12}$ as $-2\frac{14}{12}$.

$h = -\frac{5}{12}$ Subtract $2\frac{14}{12} - 2\frac{9}{12}$. The sum is negative because $\left|-3\frac{1}{6}\right| > \left|2\frac{3}{4}\right|$.

Solve each equation.

1. $h + \frac{3}{4} = \frac{7}{8}$ _____

2. $e + 1\frac{13}{16} = 2\frac{5}{16}$ _____

3. $m + \frac{5}{8} = -\frac{3}{16}$ _____

4. $p - 4\frac{5}{12} = 2\frac{7}{12}$ _____

5. $x - \frac{5}{9} = \frac{5}{6}$ _____

6. $y - \frac{7}{8} = -\frac{15}{16}$ _____

7. $h + 2\frac{1}{2} = -1\frac{1}{4}$ _____

8. $n - 3\frac{2}{5} = -1\frac{7}{10}$ _____

9. $f + 4\frac{3}{8} = 2\frac{1}{3}$ _____

10. $b - 1\frac{2}{5} = 1\frac{4}{7}$ _____

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Reteaching 5-8 Solving Equations by Multiplying Fractions

Solve $-4\frac{2}{5}x = 1\frac{1}{10}$.

$-4\frac{2}{5}x = 1\frac{1}{10}$

$-\frac{22}{5}x = \frac{11}{10}$ Write $-4\frac{2}{5}$ as $-\frac{22}{5}$ and $1\frac{1}{10}$ as $\frac{11}{10}$.

$-\frac{5}{22} \cdot -\frac{22}{5}x = -\frac{5}{22} \cdot \frac{11}{10}$ Multiply each side by $-\frac{5}{22}$, the reciprocal of $-\frac{22}{5}$.

$x = -\frac{\cancel{5}^{1}}{\cancel{22}_{2}} \cdot \frac{\cancel{11}^{1}}{\cancel{10}_{2}} = -\frac{1}{4}$ Divide common factors and simplify.

Solve each equation.

1. $8x = 12$ _____

2. $\frac{1}{2}x = \frac{3}{4}$ _____

3. $-\frac{4}{5}y = -\frac{1}{3}$ _____

4. $5h = -\frac{10}{11}$ _____

5. $-\frac{3}{14}j = -1\frac{2}{7}$ _____

6. $\frac{4}{5}p = 2\frac{3}{10}$ _____

7. $1\frac{3}{7}m = \frac{6}{7}$ _____

8. $-\frac{5}{9}n = 2\frac{2}{3}$ _____

9. $4\frac{1}{2}x = 5\frac{5}{8}$ _____

10. $-1\frac{2}{3}k = 4\frac{1}{6}$ _____

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Practice 5-8 Solving Equations by Multiplying Fractions

Solve each equation.

1. $\frac{3}{4}x = \frac{9}{16}$ _____
2. $-\frac{1}{3}p = \frac{1}{4}$ _____
3. $\frac{-3}{8}k = \frac{1}{2}$ _____
4. $\frac{1}{8}h = \frac{1}{10}$ _____
5. $2\frac{2}{3}e = \frac{1}{18}$ _____
6. $-1\frac{2}{7}m = 6$ _____
7. $-\frac{1}{4}p = \frac{1}{18}$ _____
8. $\frac{11}{-12}w = -1$ _____
9. $-3\frac{4}{7}x = 0$ _____
10. $\frac{2}{3}m = 2\frac{2}{9}$ _____
11. $5c = \frac{2}{3}$ _____
12. $-8k = \frac{4}{5}$ _____
13. $\frac{4}{7}y = 4$ _____
14. $2\frac{1}{4}f = \frac{6}{5}$ _____
15. $\frac{10}{11}n = \frac{2}{11}$ _____
16. $\frac{7}{8}c = \frac{7}{6}$ _____

Solve each equation using mental math.

17. $7d = 42$ _____
18. $\frac{1}{4}y = 5$ _____
19. $-3h = \frac{3}{8}$ _____
20. $\frac{1}{5}k = -\frac{1}{3}$ _____

Write an equation to solve each problem.

21. It takes Nancy $1\frac{2}{3}$ min to read 1 page in her social studies book. It took her $22\frac{1}{2}$ min to complete her reading assignment. How long was the assignment? Let m represent the number of pages she read.

_____

22. It takes Gary three hours to drive to Boston. If the trip is 156 miles, what is Gary's average number of miles per hour? Let x represent the miles per hour.

_____

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Reteaching 5-9 Powers of Products and Quotients

Simplify $\left(\frac{x^3}{-y^2}\right)^5$.

$\left(\frac{x^3}{-y^2}\right)^5 = \frac{(x^3)^5}{(-y^2)^5}$ Raise both the numerator and the denominator to the power of 5.

$= \frac{x^{15}}{(-1)^5(y^2)^5}$ Multiply exponents in the numerator. Raise each factor to the power of 5 in the denominator.

$= -\frac{x^{15}}{y^{10}}$ Multiply exponents and simplify.

Simplify each expression.

1. $(2 \cdot 5)^4$ _____
2. $(-3 \cdot 2)^3$ _____
3. $(4x)^2$ _____
4. $(a^2b)^5$ _____
5. $(3ab^3)^2$ _____
6. $-(5m^2n^3)^3$ _____
7. $\left(\frac{2}{9}\right)^2$ _____
8. $\left(-\frac{7}{8}\right)^2$ _____
9. $\left(-\frac{3}{10}\right)^3$ _____
10. $\left(\frac{4}{x^4}\right)^2$ _____
11. $\left(\frac{3x}{5}\right)^3$ _____
12. $\left(-\frac{a^2}{b^5}\right)^4$ _____
13. $\left(\frac{xy^2}{2z^3}\right)^5$ _____
14. $\left(\frac{-1}{2n^3}\right)^4$ _____
15. $\left(\frac{-2r^3s}{3t^2}\right)^2$ _____
16. $\left(\frac{-3}{a^2bc^2}\right)^3$ _____
17. $(p^4q^3r^2)^3$ _____
18. $\left(\frac{x^2yz^3}{-2}\right)^4$ _____
19. $\left(\frac{5}{j^3k}\right)^2$ _____
20. $\left(\frac{ac^4}{4b}\right)^3$ _____

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Practice 5-9 Powers of Products and Quotients

Simplify each expression.

1. $\left(\frac{5}{6}\right)^2$ _____
2. $\left(-\frac{4}{9}\right)^2$ _____
3. $\left(\frac{x^2}{5}\right)^3$ _____
4. $(2x)^3$ _____
5. $(-3y^2)^2$ _____
6. $(5ab^2)^3$ _____
7. $(12mn)^2$ _____
8. $(-10xy^3)^3$ _____
9. $(9qrs^4)^3$ _____
10. $\left(\frac{2x}{9y}\right)^2$ _____
11. $-(a^2b^2)^3$ _____
12. $(2a^3b^2)^4$ _____
13. $\left(\frac{2x}{y}\right)^2$ _____
14. $\left(-\frac{3x}{8y}\right)^2$ _____
15. $\left(\frac{3y^2}{x}\right)^3$ _____
16. $\left(\frac{2x^2y}{xy^3}\right)^5$ _____

Evaluate for $a = 2$, $b = -1$, and $c = \frac{1}{3}$.

17. $(a^2)^3$ _____
18. $2b^3$ _____
19. $(-9c^2)^3$ _____
20. $(a^2b)^2$ _____
21. $(ac)^2$ _____
22. $(b^3)^7$ _____

Complete each equation.

23. $(3b^{\_\_\_\_})^2 = 9b^{10}$
24. $(m^2n)^{\_\_\_\_} = m^8n^4$
25. $(xy^{\_\_\_\_})^2 = x^2y^6$
26. $\left(\frac{3s^2t}{r}\right)^{\_\_\_\_} = \frac{9s^4t^2}{r^2}$

27. Write an expression for the area of a square with a side of length $4a^2$. Simplify your expression.

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28. Write an expression for the volume of a cube with a side of length $3z^5$. Simplify your expression.

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