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Common Fraction/Decimal/Percents Algebra Preparation

Fraction	Decimal	Percent
1/2	0.5	50%
1/3	$0.\overline{33}$	$33.\overline{33}\%$
2/3	$0.\overline{66}$	$66.\overline{66}\%$
1/4	0.25	25%
3/4	0.75	75%
1/5	0.2	20%
2/5	0.4	40%
3/5	0.6	60%
1/8	0.125	12.5%
3/8	0.375	37.5%
5/8	0.625	62.5%
7/8	0.875	87.5%
4/5	0.8	80%
1/10	0.1	10%
3/10	0.3	30%
7/10	0.7	70%
9/10	0.9	90%

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Common Squares and Square Roots

Algebra Preperation

Square Root	Square Number
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100
11	121
12	144

Square Root	Square Number
13	169
14	196
15	225
16	256
17	289
18	324
19	361
20	400
21	441
22	484
23	529
24	576
25	625

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6-3

Study Guide and Intervention

Adding and Subtracting Mixed Numbers

To add or subtract mixed numbers:

1. Add or subtract the fractions. Rename using the LCD if necessary.
2. Add or subtract the whole numbers.
3. Simplify if necessary.

EXAMPLE 1 **Find $14\frac{1}{2} + 18\frac{2}{3}$.**

$14\frac{1}{2} \rightarrow 14\frac{3}{6}$ Rename the fractions.

$+18\frac{2}{3} \rightarrow +18\frac{4}{6}$ Add the whole numbers and add the fractions.

$32\frac{7}{6}$ or $33\frac{1}{6}$ Simplify.

EXAMPLE 2 **Find $21 - 12\frac{5}{8}$.**

$21 \rightarrow 20\frac{8}{8}$ Rename 21 as $20\frac{8}{8}$.

$-12\frac{5}{8} \rightarrow -12\frac{5}{8}$ First subtract the whole numbers and then the fractions.

$8\frac{3}{8}$

EXERCISES

Add or subtract. Write in simplest form.

1. $7\frac{3}{4} + 2\frac{3}{4}$
2. $14\frac{2}{9} - 6\frac{1}{9}$
3. $9\frac{1}{5} - 4\frac{3}{4}$
4. $7\frac{1}{8} + 5\frac{3}{8}$
5. $7\frac{3}{4} + 2\frac{2}{3}$
6. $5\frac{1}{2} - 5\frac{1}{3}$
7. $5\frac{1}{2} - 3\frac{1}{4}$
8. $6\frac{1}{3} + 2\frac{1}{6}$
9. $9 - 3\frac{2}{5}$
10. $2\frac{2}{3} + 7\frac{1}{2}$
11. $6\frac{1}{2} - 6\frac{1}{3}$
12. $18\frac{1}{2} + 5\frac{5}{8}$

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6-4

Study Guide and Intervention

Multiplying Fractions and Mixed Numbers

To multiply fractions, multiply the numerators and multiply the denominators.

$$\frac{5}{6} \times \frac{3}{5} = \frac{5 \times 3}{6 \times 5} = \frac{15}{30} = \frac{1}{2}$$

To multiply mixed numbers, rename each mixed number as a fraction. Then multiply the fractions.

$$2\frac{2}{3} \times 1\frac{1}{4} = \frac{8}{3} \times \frac{5}{4} = \frac{40}{12} = 3\frac{1}{3}$$

EXAMPLE 1 **Find $\frac{2}{3} \times \frac{4}{5}$. Write in simplest form.**

$\frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5}$ ← Multiply the numerators. ← Multiply the denominators.

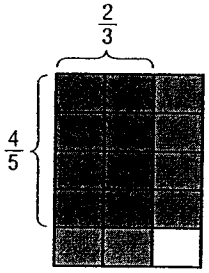
$= \frac{8}{15}$ Simplify.

EXAMPLE 2 **Find $\frac{1}{3} \times 2\frac{1}{2}$. Write in simplest form.**

$\frac{1}{3} \times 2\frac{1}{2} = \frac{1}{3} \times \frac{5}{2}$ Rename $2\frac{1}{2}$ as an improper fraction, $\frac{5}{2}$.

$= \frac{1 \times 5}{3 \times 2}$ Multiply.

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



EXERCISES

Multiply. Write in simplest form.

1. $\frac{2}{3} \times \frac{2}{3}$
2. $\frac{1}{2} \times \frac{7}{8}$
3. $\frac{1}{3} \times \frac{3}{5}$
4. $\frac{5}{9} \times 4$
5. $1\frac{2}{3} \times \frac{3}{5}$
6. $3\frac{3}{4} \times 1\frac{1}{6}$
7. $\frac{3}{4} \times 1\frac{2}{3}$
8. $3\frac{1}{3} \times 2\frac{1}{2}$
9. $4\frac{1}{5} \times \frac{1}{7}$
10. $\frac{7}{5} \times 8$
11. $2\frac{1}{3} \times \frac{4}{6}$
12. $\frac{1}{8} \times 2\frac{3}{4}$

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6-6

Study Guide and Intervention

Dividing Fractions and Mixed Numbers

To divide by a fraction, multiply by its multiplicative inverse or reciprocal.

To divide by a mixed number, rename the mixed number as an improper fraction.

EXAMPLE 1 **Find $3\frac{1}{3} \div \frac{2}{9}$. Write in simplest form.**

$3\frac{1}{3} \div \frac{2}{9} = \frac{10}{3} \div \frac{2}{9}$ Rename $3\frac{1}{3}$ as an improper fraction.

$= \frac{10}{3} \cdot \frac{9}{2}$ Multiply by the reciprocal of $\frac{2}{9}$, which is $\frac{9}{2}$.

$= \frac{\overset{5}{\cancel{10}}}{\underset{1}{\cancel{3}}} \cdot \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{2}}}$ Divide out common factors.

$= 15$ Multiply.

EXERCISES

Divide. Write in simplest form.

1. $\frac{2}{3} \div \frac{1}{4}$

2. $\frac{2}{5} \div \frac{5}{6}$

3. $\frac{1}{2} \div \frac{1}{5}$

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

5. $\frac{5}{8} \div 10$

6. $7\frac{1}{3} \div 2$

7. $\frac{5}{6} \div 3\frac{1}{2}$

8. $36 \div 1\frac{1}{2}$

9. $2\frac{1}{2} \div 10$

10. $5\frac{2}{5} \div 1\frac{4}{5}$

11. $6\frac{2}{3} \div 3\frac{1}{9}$

12. $4\frac{1}{4} \div \frac{3}{8}$

13. $4\frac{6}{7} \div 2\frac{3}{7}$

14. $12 \div 2\frac{1}{2}$

15. $4\frac{1}{6} \div 3\frac{1}{6}$

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3-4

Study Guide and Intervention

Adding Integers

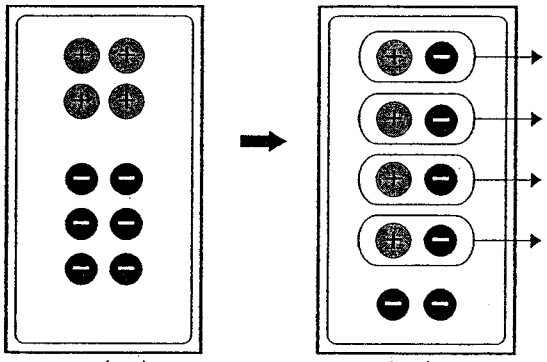
For integers with the same sign:
- the sum of two positive integers is positive.
- the sum of two negative integers is negative.

For integers with different signs, subtract their absolute values. The sum is:
- positive if the positive integer has the greater absolute value.
- negative if the negative integer has the greater absolute value.

To add integers, it is helpful to use counters or a number line.

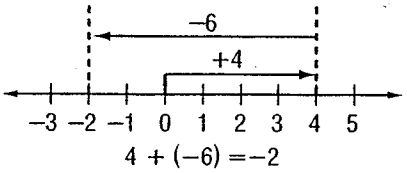
EXAMPLE 1 **Find 4 + (−6).**

Method 1 Use counters.
Combine a set of 4 positive counters and a set of 6 negative counters on a mat.



4 + (−6) 4 + (−6) = −2

Method 2 Use a number line.
- Start at 0.
- Move 4 units right.
- Then move 6 units left.



4 + (−6) = −2

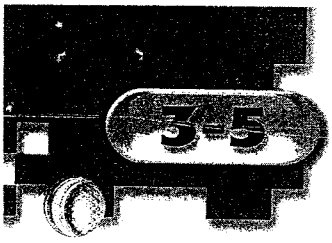
EXERCISES

Add.

1. −5 + (−2)
2. 8 + 1
3. −7 + 10
4. 16 + (−11)
5. −22 + (−7)
6. −50 + 50
7. −10 + (−10)
8. 100 + (−25)
9. −35 + −20

Evaluate each expression if $a = 8$, $b = -8$, and $c = 4$.

10. $a + 15$
11. $b + (-9)$
12. $a + b$
13. $b + c$
14. $-10 + c$
15. $12 + b$



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Study Guide and Intervention

Subtracting Integers

To subtract an integer, add its opposite.

EXAMPLE 1 **Find $6 - 9$.**

$6 - 9 = 6 + (-9)$ To subtract 9, add -9.
$= -3$ Simplify.

EXAMPLE 2 **Find $-10 - (-12)$.**

$-10 - (-12) = -10 + 12$ To subtract -12, add 12.
$= 2$ Simplify.

EXAMPLE 3 **Evaluate $a - b$ if $a = -3$ and $b = 7$.**

$a - b = -3 - 7$ Replace a with -3 and b with 7.
$= -3 + (-7)$ To subtract 7, add -7.
$= -10$ Simplify.

EXERCISES

Subtract.

1. $7 - 9$
2. $20 - (-6)$
3. $-10 - 4$
4. $0 - 12$
5. $-7 - 8$
6. $13 - 18$
7. $-20 - (-5)$
8. $-8 - (-6)$
9. $25 - (-14)$
10. $-75 - 50$
11. $15 - 65$
12. $19 - (-10)$

Evaluate each expression if $m = -2$, $n = 10$, and $p = 5$.

13. $m - 6$
14. $9 - n$
15. $p - (-8)$
16. $p - m$
17. $m - n$
18. $-25 - p$

NAME _____ DATE _____

3-6

Study Guide and Intervention

Multiplying Integers

The product of two integers with **different** signs is **negative**.

The product of two integers with the **same** sign is **positive**.

EXAMPLE 1 **Multiply $5(-2)$.**

$5(-2) = -10$ The integers have different signs. The product is negative.

EXAMPLE 2 **Multiply $-3(7)$.**

$-3(7) = -21$ The integers have different signs. The product is negative.

EXAMPLE 3 **Multiply $-6(-9)$.**

$-6(-9) = 54$ The integers have the same sign. The product is positive.

EXAMPLE 4 **Multiply $(-7)^2$.**

$(-7)^2 = (-7)(-7)$ There are 2 factors of -7.

$= 49$ The product is positive.

EXAMPLE 5 **Simplify $-2(6c)$.**

$-2(6c) = (-2 \cdot 6)c$ Associative Property of Multiplication.

$= -12c$ Simplify.

EXAMPLE 6 **Simplify $2(5x)$.**

$2(5x) = (2 \cdot 5)x$ Associative Propery of Multiplication.

$= 10x$ Simplify.

EXERCISES

Multiply.

1. $-5(8)$
2. $-3(-7)$
3. $10(-8)$
4. $-8(3)$
5. $-12(-12)$
6. $(-8)^2$

ALGEBRA Simplify each expression.

7. $-5(7a)$
8. $3(-2x)$
9. $4(6f)$
10. $7(6b)$
11. $-6(-3y)$
12. $7(-8g)$

ALGEBRA Evaluate each expression if $a = -3$, $b = -4$, and $c = 5$.

13. $-2a$
14. $9b$
15. ab
16. $-3ac$
17. $-2c^2$
18. abc

Study Guide and Intervention

Dividing Integers

The quotient of two integers with different signs is negative.
The quotient of two integers with the same sign is positive.

EXAMPLE 1 **Divide $30 \div (-5)$.**

$30 \div (-5)$ The integers have different signs.

$30 \div (-5) = -6$ The quotient is negative.

EXAMPLE 2 **Divide $-100 \div (-5)$.**

$-100 \div (-5)$ The integers have the same sign.

$-100 \div (-5) = 20$ The quotient is positive.

EXERCISES

Divide.

1. $-12 \div 4$
2. $-14 \div (-7)$
3. $\frac{18}{-2}$
4. $-6 \div (-3)$
5. $-10 \div 10$
6. $\frac{-80}{-20}$
7. $350 \div (-25)$
8. $-420 \div (-3)$
9. $\frac{540}{45}$
10. $\frac{-256}{16}$

ALGEBRA Evaluate each expression if $d = -24$, $e = -4$, and $f = 8$.

11. $12 \div e$
12. $40 \div f$
13. $d \div 6$
14. $d \div e$
15. $f \div e$
16. $e^2 \div f$
17. $\frac{-d}{e}$
18. $ef \div 2$
19. $\frac{f^2}{e^2}$
20. $\frac{de}{f}$