

Flexible Instructional Day Kraycik Pre-Algebra Packet

Day 6: Pages 1.3, 1.4

Day 7: Pages 1.7, 1.9

Day 8: Pages 1.10, 1.12

Day 9: Pages 1.3, 1.4

Day 10: Pages 2.9, 3.8

**Day 11 : Make sure all pages are
complete.**

**Due two days after your return to school
This work will be graded in Option C for completion and accuracy.**

1-3 Greatest Common Factor (GCF)

Name _____

Date _____

Find the greatest common factor (GCF) of 42 and 60.

- Find the prime factorization of each number.
 $42 = 2 \cdot 3 \cdot 7$ $60 = 2 \cdot 2 \cdot 3 \cdot 5$
- Multiply their common prime factors to find the GCF.
 $2 \cdot 3 = 6$, so the GCF = 6.

Use the GCF to simplify the fraction $\frac{42}{60}$.

- Divide the numerator and denominator by the GCF. $\frac{42 \div 6}{60 \div 6} = \frac{7}{10}$

In simplest form, $\frac{42}{60} = \frac{7}{10}$.

Write an equivalent fraction to $\frac{18}{72}$.

- Multiply or divide both numerator and denominator by the *same nonzero number*.

$$\frac{18 \cdot 3}{72 \cdot 3} = \frac{54}{216}$$

$$\frac{18 \div 18}{72 \div 18} = \frac{1}{4}$$

The fractions $\frac{54}{216}$ and $\frac{1}{4}$ are equivalent to $\frac{18}{72}$.

Find the value of n .

$$-\frac{3}{5} = \frac{n}{25} \rightarrow -\frac{3}{5} = -\frac{3 \cdot 5}{5 \cdot 5} = -\frac{15}{25} \quad \text{So } n = -15.$$

$$\frac{24}{32} = \frac{n}{4} \rightarrow \frac{24}{32} = \frac{24 \div 8}{32 \div 8} = \frac{3}{4} \quad \text{So } n = 3.$$

Find the greatest common factor (GCF).

- | | | | |
|--|-----------------------------|------------------------------|-----------------------------|
| 1. 30 and 42
$30 = 2 \cdot 3 \cdot 5$
$42 = 2 \cdot 3 \cdot 7$; $2 \cdot 3 = 6$; 6 | 2. 56 and 70
_____ | 3. 45 and 75
_____ | 4. 36 and 54
_____ |
| 5. 32 and 81
_____ | 6. 89 and 64
_____ | 7. 14 and 49
_____ | 8. 35 and 15
_____ |
| 9. 12, 18, and 30
_____ | 10. 48, 64, and 72
_____ | 11. 50, 75, and 125
_____ | 12. 16, 28, and 56
_____ |

Simplify.

- | | | | | | |
|---|--------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| 13. $\frac{14}{20}$
$\frac{14}{20} = \frac{2 \cdot 7}{2 \cdot 2 \cdot 5} = \frac{7}{10}$ | 14. $-\frac{9}{36}$
_____ | 15. $\frac{4}{48}$
_____ | 16. $-\frac{8}{56}$
_____ | 17. $\frac{15}{45}$
_____ | 18. $\frac{20}{50}$
_____ |
| 19. $\frac{52}{65}$
_____ | 20. $-\frac{38}{57}$
_____ | 21. $\frac{32}{44}$
_____ | 22. $\frac{45}{117}$
_____ | 23. $\frac{49}{112}$
_____ | 24. $-\frac{33}{165}$
_____ |
| 25. $\frac{105}{140}$
_____ | 26. $-\frac{88}{132}$
_____ | 27. $\frac{144}{160}$
_____ | 28. $-\frac{125}{375}$
_____ | 29. $\frac{132}{156}$
_____ | 30. $-\frac{168}{180}$
_____ |



Write two equivalent fractions for each given fraction.

31. $\frac{4}{6}$

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

$$\frac{4 \cdot 2}{6 \cdot 2} = \frac{8}{12}$$

32. $-\frac{9}{12}$

33. $\frac{64}{72}$

34. $-\frac{32}{56}$

35. $\frac{7}{11}$

36. $-\frac{9}{15}$

Find the value of n .

37. $\frac{4}{9} = \frac{n}{27}$

$$\frac{4 \cdot 3}{9 \cdot 3} = \frac{12}{27}; n = 12$$

38. $\frac{3}{5} = \frac{n}{75}$

39. $-\frac{n}{36} = -\frac{7}{12}$

40. $-\frac{n}{144} = -\frac{5}{24}$

41. $\frac{3}{4} = \frac{15}{n}$

42. $\frac{5}{8} = \frac{n}{72}$

43. $\frac{7}{10} = \frac{n}{80}$

44. $\frac{n}{4} = \frac{24}{8}$

45. $\frac{n}{-55} = \frac{6}{11}$

46. $\frac{8}{64} = \frac{4}{n}$

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

47. 0.36

$$\frac{36}{100} = \frac{2 \cdot 2 \cdot 3 \cdot 3}{2 \cdot 2 \cdot 5 \cdot 5} = \frac{9}{25}$$

48. -0.65

49. -3.07

50. 6.81

51. 5.225

52. 0.015

53. -10.875

54. -9.008

55. -6.35

56. 7.055

Problem Solving

57. The 36 boys and 45 girls in the Science Club will be broken into groups of boys or girls. The adviser wants the same number of boys or girls in each group. What is the greatest number of boys or girls the adviser can have in a group?

58. Martina is practicing her free-throw shots. So far, she has made 16 out of 20 shots. If she attempts 80 more shots and shoots with the same accuracy, how many more shots should she expect to make?

TEST PREPARATION

Choose the best answer.

59. Which of these numbers has the greatest number of prime factors?

- A. 176 B. 175 C. 136 D. 135

60. Which of these numbers has the greatest number of *different* prime factors?

- F. 176 G. 185 H. 195 J. 205

1-4 Multiples: LCM and LCD

Name _____

Date _____

Find the least common multiple (LCM) of 21, 25, and 35.

- Find the prime factorization of each number.

$$21 = 3 \cdot 7 \quad 25 = 5 \cdot 5 = 5^2 \quad 35 = 5 \cdot 7$$

- Write each prime factor the greatest number of times it occurs in any of the numbers. Multiply these factors to find the LCM.

$$3 \cdot 7 \cdot 5^2 = 525 \quad \text{So LCM} = 525.$$

Remember:

- If two numbers are *relatively prime*, the LCM is the product of the numbers.
- If one number is a *multiple* of the other number, the LCM is the greater number.

The least common denominator (LCD) of two or more fractions is the LCM of their denominators.

Rename $5\frac{2}{27}$, $\frac{16}{9}$, and $-\frac{7}{3}$ using the LCD.

$$5\frac{2}{27} = \frac{5 \cdot 27 + 2}{27} = \frac{137}{27}$$

$$\frac{16}{9} = \frac{16 \cdot 3}{9 \cdot 3} = \frac{48}{27}$$

$$-\frac{7}{3} = \frac{-7 \cdot 9}{3 \cdot 9} = \frac{-63}{27}$$

$$\text{So } 5\frac{2}{27}, \frac{16}{9}, -\frac{7}{3} = \frac{137}{27}, \frac{48}{27}, \frac{-63}{27}.$$

Think

27 is a multiple of 9 and 3.
LCM: 27
LCD: 27

Find the least common multiple (LCM).

1. 12 and 15

$$12 = 2^2 \cdot 3$$

$$15 = 3 \cdot 5$$

$$\text{LCM} = 2^2 \cdot 3 \cdot 5 = 60$$

2. 9 and 26

3. 10 and 16

4. 18, 30, and 60

5. 12, 30, and 42

6. 30, 45, and 150

7. 50, 75, and 125

8. 54, 63, and 108

For each pair of numbers, write the term that best applies: *relatively prime* or *multiple*. Then find the LCM.

9. 15 and 45

10. 8 and 9

11. 6 and 54

12. 11 and 20

multiple; 45

Find the LCM.

13. $45xyz$ and $75x^5y^2$

$$45xyz = 3^2 \cdot 5 \cdot x \cdot y \cdot z$$

$$75x^5y^2 = 3 \cdot 5^2 \cdot x^5 \cdot y^2$$

$$3^2 \cdot 5^2 \cdot x^5 \cdot y^2 \cdot z$$

$$225x^5y^2z$$

14. c^2 and b^2c^3

15. $7x^2y$ and $14xy^2$

16. $3r^3$ and $9r^2t$

17. $15a^2bc$ and $30a^2b^2$

18. $6x^2y$ and $4x^3$

19. $3m^2n$ and $15m^2n^2$

20. $120a^4b$ and $84a^3b^2$

Find the least common denominator (LCD).

21. $\frac{2}{15}$ and $\frac{4}{9}$

$15 = 3 \cdot 5$

$9 = 3^2$

$LCD = 3^2 \cdot 5 = 45$

22. $-\frac{25}{144}$ and $\frac{29}{54}$

23. $\frac{4g}{25e^2f^3}$ and $\frac{24e}{125fg^3}$

24. $\frac{12m}{35n^4p}$ and $\frac{7m}{12n^2p^2}$

Rename the set of fractions using the LCD.

25. $\frac{7}{30}$ and $-\frac{3}{8}$

$30 = 2 \cdot 3 \cdot 5; 8 = 2^3$

$2^3 \cdot 3 \cdot 5 = 120$

$\frac{7 \times 4}{30 \times 4} = \frac{28}{120}$

$-\frac{3 \times 15}{8 \times 15} = -\frac{45}{120}$

26. $-\frac{5}{6}$ and $-\frac{8}{15}$

27. $-\frac{1}{3}, \frac{5}{6}, -\frac{7}{12}$

28. $\frac{1}{12}, -\frac{3}{16}, -\frac{5}{18}$

29. $2\frac{3}{5}, \frac{9}{4}, -\frac{1}{25}$

30. $-\frac{5}{3}, 3\frac{2}{9}, -\frac{5}{6}$

31. $\frac{2c}{3a^2}, -\frac{7}{12a^2}, \frac{1}{6a}$

32. $\frac{9}{35b}, -\frac{11}{50}, \frac{8}{7b}$

Problem Solving

33. Lynne is making pins for a charity fundraiser. She uses 1 pink bead and 1 white bead for each pin. The pink beads come in bags of 48. The white beads come in bags of 30. What is the fewest number of bags of each color she must buy to have the same number of white beads and pink beads? How many pins will she be able to make?

34. A landscaper is buying thyme, sage, and lavender to plant along a walkway. Thyme comes in flats of 36, lavender comes in flats of 12, and sage comes in flats of 24. She wants to have the same number of each type of plant. What is the least number of flats of each type she should buy? How many plants of each type will she have?

CHALLENGE

35. A pair of numbers has a GCF of 14 and LCM of 168. What could the numbers be? Explain.

36. *Twin primes* are pairs of prime numbers, like 3 and 5, that *differ by two*. List the other pairs of twin primes between 1 and 100.

I-7 Add Rational Numbers

Name _____ Date _____

To add rational numbers with *like* signs:

- Add their absolute values.
- Use the sign of the addends for the sum.

Add: $-12.45 + (-5.25)$

$$|-12.45| + |-5.25| = 12.45 + 5.25 = 17.7$$

$$-12.45 + (-5.25) = -17.7 \leftarrow \text{The addends are negative, so the sum is negative.}$$

So $-12.45 + (-5.25) = -17.7$.

To add rational numbers with *unlike* signs:

- Subtract the lesser absolute value from the greater.
- Use the sign of the addend with the greater absolute value for the sum.

Add: $-7.27 + 3.5$

$$|-7.27| - |3.5| = 7.27 - 3.5 = 3.77$$

$$-7.27 + 3.5 = -3.77 \leftarrow \text{The addend with the greater absolute value is negative, so the sum is negative.}$$

So $-7.27 + 3.5 = -3.77$.

Find the sum.

1. $-7 + 9$

2. $-6 + (-4)$

3. $-73 + 65$

4. $88 + (-59)$

5. $1 + (-6.2)$

$|9| - |-7| = 9 - 7 = 2$

6. $3.6 + (-2)$

7. $9.3 + 5.8$

8. $-3.2 + 10$

9. $8.7 + 6.3$

10. $-13.6 + (-21.5)$

11. $-9.9 + (-9.9)$

12. $-45 + 60.5$

13. $0.81 + (-3.19)$

14. $90.09 + (-9.91)$

15. $-22.7 + (-9.07)$

16. $-\frac{8}{15} + \frac{2}{3}$

17. $-\frac{8}{9} + \frac{5}{6}$

18. $-\frac{5}{12} + \left(-\frac{5}{8}\right)$

19. $\frac{5}{14} + \frac{8}{21}$

20. $-3\frac{3}{4} + 2\frac{2}{5}$

Estimate by rounding. Then add.

21. $-4.25 + \left(-\frac{3}{5}\right)$

22. $-5.4 + \left(-\frac{3}{8}\right)$

23. $-16 + 4\frac{5}{8}$

$-4.25 + (-0.6) = -4.85$

24. $-17 + 5.2 + (-8.8)$

25. $55 + (-4.7) + 35$

26. $-7\frac{9}{16} + 20$

27. $-(7.3 - 6.5) + 3\frac{1}{8}$

28. $-8\frac{3}{4} + [-13 + (-5.9)]$

29. $\left[\frac{17}{9} + \left(-\frac{5}{36}\right)\right] + 4\frac{1}{4}$

30. $-\frac{5}{42} + \left[-\frac{8}{14} + \left(-\frac{5}{7}\right)\right]$

31. $-9\frac{4}{15} + 9\frac{15}{16} + 9\frac{4}{15}$

32. $-5\frac{7}{8} + \left(-3\frac{3}{14}\right) + 5\frac{7}{8}$

Estimate by rounding. Then add.

33. $-3.5 + 2.7 + (-7)$

$$\begin{aligned} &|-3.5| - |2.7| \\ &= 3.5 - 2.7 = 0.8; -0.8 \\ &-0.8 + (-7) = -7.8 \end{aligned}$$

34. $-1.1 + (-5.7) + (-4)$

35. $-3.8 + (-2.6) + 7.1$

36. $3\frac{1}{2} + [(-1\frac{1}{4}) + 1\frac{1}{4}]$

37. $(-2\frac{1}{5} + 2\frac{1}{5}) + [3\frac{2}{3} + (-\frac{1}{4})]$

38. $2\frac{3}{5} + (-1\frac{1}{2} + \frac{1}{2})$

Solve. Show your work.

39. **Biology** An elephant seal pup weighed 19.975 kg at birth. The table shows his weight changes in his first five days. How much did the pup weigh at the end of Day 5?

Day	1	2	3	4	5
Weight Change (in kg)	-0.185	-0.03	2.65	2.96	3.512

40. A scuba diver descended 30.3 m below the ocean surface, rose 16.6 m and then descended 7.1 m. How far below the ocean surface is the diver?

41. Last month Skip had \$125.50 in his checking account. He withdrew \$50 last week and \$27.60 this week. What was his balance after these transactions?

42. Pia has 1 cup of milk that she wants to use. She uses $\frac{1}{4}$ c, $\frac{1}{3}$ c, and $\frac{3}{8}$ c in three recipes. Did Pia use the entire cup? Explain.

43. A diver was at depth of $-90\frac{1}{5}$ ft. He rose $40\frac{3}{5}$ ft to where another diver was. At what depth were the two divers?

CHALLENGE

Find the sum.

To add rational expressions, follow the same rules as adding rational numbers.

$$\frac{x}{3} + \frac{x}{3} \rightarrow \frac{x+x}{3} = \frac{2x}{3}$$

44. $\frac{x}{2} + \frac{x}{2}$

45. $\frac{2x}{3} + \frac{x}{3}$

46. $\frac{x}{2} + \frac{x}{3}$

I-9 Multiply Rational Numbers

Name _____

Date _____

If two rational numbers have *like signs*, their product is *positive*. If they have *unlike signs*, their product is *negative*.

Multiplying Integers

$$\begin{aligned} 12(4) &= 48 && \leftarrow (+)(+) = (+) \\ -12(-4) &= 48 && \leftarrow (-)(-) = (+) \\ -12(4) &= -48 && \leftarrow (-)(+) = (-) \\ 12(-4) &= -48 && \leftarrow (+)(-) = (-) \end{aligned}$$

Multiplying Decimals

Multiply: $4.7(-5.06)$

$$4.7(-5.06) = -23.782 \leftarrow \text{The total number of decimal places in the factors is equal to the number of decimal places in the product.}$$

$$\text{So } 4.7(-5.06) = -23.782.$$

Multiplying Fractions

Find the product: $(-4\frac{2}{3})(-14\frac{1}{4})$

$$(-4\frac{2}{3})(-14\frac{1}{4}) = -\frac{14}{\frac{3}{1}} \cdot -\frac{57}{\frac{4}{2}} = \frac{133}{2} = 66\frac{1}{2}$$

$$\text{So } (-4\frac{2}{3})(-14\frac{1}{4}) = 66\frac{1}{2}.$$

Find the product.

1. $-2(-12)$

2. $7 \cdot 11$

3. $-7 \cdot 6$

4. $9(-4)$

5. $-1(2.2)$

$$\begin{aligned} 2 \cdot 12 &= 24 \\ (-) \cdot (-) &= (+) \\ \hline &24 \end{aligned}$$

6. $1.5(-0.2)$

7. $0(-5.7)$

8. $-6.2(-1)$

9. $-16(-0.5)$

10. $-4.2(-1.8)$

11. $-50(-1.4)$

12. $-3.7(-0.14)$

13. $\frac{3}{5}(-15)$

14. $-\frac{2}{5}(\frac{5}{6})$

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

16. $-\frac{7}{8}(-\frac{16}{21})$

17. $-1\frac{1}{6}(2\frac{2}{5})$

18. $3\frac{1}{3}(-1\frac{1}{5})$

19. $(-1\frac{3}{5})(-7\frac{1}{2})$

20. $-3\frac{3}{4}(2\frac{2}{5})$

21. $(4\frac{1}{5})(-\frac{1}{4})$

22. $(-\frac{9}{11})(-2\frac{1}{3})$

23. $(-\frac{7}{18})(\frac{3}{5})$

24. $(9\frac{2}{7})(-\frac{14}{15})$

25. $12(-\frac{3}{8})$

26. $-15 \cdot \frac{14}{27}$

27. $-22(-3\frac{9}{11})$

28. $5(-7\frac{3}{10})$

29. $(11\frac{1}{2})(8)$

30. $-10\frac{5}{6} \cdot 4.8$

Estimate by rounding. Then multiply.

31. $\frac{2}{3}\left(-\frac{9}{11} + \frac{3}{8}\right)$

$$\left(\frac{2}{3} \cdot -\frac{9}{11}\right) + \left(\frac{2}{3} \cdot \frac{3}{8}\right)$$

$$-\frac{6}{11} + \frac{1}{4} = \frac{-24 + 11}{44} = -\frac{13}{44}$$

32. $-\frac{2}{3}\left(-9 - \frac{4}{5}\right)$

33. $\frac{2}{5}\left(-\frac{15}{22} + 4.5\right)$

34. $\frac{7}{8}\left(6.4 - \frac{1}{2}\right)$

35. $7\left(-2\frac{1}{3} - \frac{5}{21}\right)$

36. $-12\left(-\frac{5}{6} + \frac{1}{4}\right)$

Write positive or negative to complete each statement.

37. The product of two positive numbers

is a positive number.

38. The product of two negative numbers

is a _____ number.

39. The product of a negative number and a

positive number is a _____ number.

40. The product of three negative numbers

is a _____ number.

41. The product of an even number of negative

numbers is a _____ number.

42. The product of an odd number of negative

numbers is a _____ number.

Solve. Show your work.

43. What is the product when $-1\frac{1}{4}$ is doubled?

44. What is twice the sum of $-2\frac{3}{5}$ and $1\frac{1}{2}$?

45. **Chemistry** When placed in liquid nitrogen, a chemical changes in temperature by -4.8°C every second. What is the overall change in temperature in half a minute?

46. **Earth Science** During a drought the water-table level changed -0.35 m per day. If the drought lasted 2 weeks, what was the overall change in the water-table level?

MENTAL MATH

Multiply.

47. $6 \cdot 9\frac{5}{6}$

48. $-3\left(-7\frac{2}{3}\right)$

49. $9 \cdot 5\frac{7}{9}$

50. $-5\left(-11\frac{3}{10}\right)$

2-9 Pythagorean Theorem

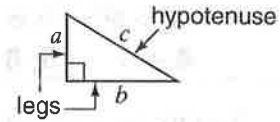
Name _____

Date _____

Pythagorean Theorem

In any *right triangle*, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

$$a^2 + b^2 = c^2$$



One leg of a right triangle has a length of 21 meters and the hypotenuse has a length of 35 meters. Find the length of the other leg.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 21^2 + b^2 &= 35^2 \\ 441 + b^2 &= 1225 \\ b^2 &= 1225 - 441 = 784 \\ \sqrt{b^2} &= \sqrt{784} \\ b &= 28 \end{aligned}$$

So the other leg is 28 meters long.

Determine whether a triangle with side lengths of 9 centimeters, 12 centimeters, and 16 centimeters is a right triangle.

$$\begin{aligned} a^2 + b^2 &= c^2 \\ 9^2 + 12^2 &\stackrel{?}{=} 16^2 \\ 81 + 144 &\stackrel{?}{=} 256 \\ 225 &\neq 256 \end{aligned}$$

Remember: The longest side of a right triangle is the hypotenuse.

So the triangle is *not* a right triangle.

Three numbers a , b , and c are a *Pythagorean triple* if they make the equation $a^2 + b^2 = c^2$ true.

Find the length of the missing side to the nearest tenth of a unit.

The legs of the triangles are a and b and the hypotenuse is c .

1. $a = 9$ mm, $b = 12$ mm, $c = ?$ 2. $a = 7$ cm, $b = ?$, $c = 25$ cm 3. $a = ?$, $b = 12$ m, $c = 15$ m

$$\begin{aligned} 9^2 + 12^2 &= c^2; 81 + 144 = c^2 \\ 225 &= c^2; c = 15 \text{ mm} \end{aligned}$$

4. $a = ?$, $b = 30$ in., $c = 50$ in. 5. $a = 12$ ft, $b = ?$, $c = 12.5$ ft 6. $a = 0.03$ m, $b = 0.04$ m, $c = ?$

7. $a = ?$, $b = 48$ yd, $c = 60$ yd 8. $a = 27$ km, $b = ?$, $c = 45$ km 9. $a = 80$ dm, $b = 60$ dm, $c = ?$

10. $a = 1.5$ mi, $b = ?$, $c = 2.5$ mi 11. $a = ?$, $b = 2.1$ m, $c = 7.5$ m 12. $a = 3$ ft, $b = 3$ ft, $c = ?$

Determine whether the given set of measures is a Pythagorean triple.

13. $a = 3$ m, $b = 4$ m, $c = 5$ m

14. $a = 9$ cm, $b = 12$ cm, $c = 15$ cm



Determine whether the given measures are the lengths of the sides of a right triangle.

15. $a = 2$ m, $b = 2$ m, $c = 4$ m
 $a^2 + b^2 = c^2$; $2^2 + 2^2 \stackrel{?}{=} 4^2$;
 $4 + 4 \stackrel{?}{=} 16$; $8 \neq 16$; no

17. $a = 0.8$ cm, $b = 1.2$ cm, $c = 1.7$ cm

19. $a = 3.5$ mm, $b = 4.5$ mm, $c = 5$ mm

21. $a = 1.4$ mm, $b = 4.8$ mm, $c = 5$ mm

23. $a = 13$ ft, $b = 84$ ft, $c = 85$ ft

16. $a = 14$ mm, $b = 48$ mm, $c = 50$ mm

18. $a = 0.7$ km, $b = 2.4$ km, $c = 2.5$ km

20. $a = 3$ cm, $b = 5$ cm, $c = 5$ cm

22. $a = 9$ in., $b = 41$ in., $c = 42$ in.

24. $a = 8$ ft, $b = 14$ ft, $c = 17$ ft

Problem Solving

25. The base of a 24-foot ladder is placed 8 feet from a wall. To the nearest tenth of a foot, how far up the wall does the ladder reach?

27. An automobile traveled 21 miles north from the airport. It then turned directly west and traveled 28 miles. How far is the automobile from the airport?

26. A play area is 20 meters long and 21 meters wide. How long is the walk that extends diagonally across the play area?

28. A garden is in the shape of a right triangle. One leg of the triangle is 5 feet long, and the hypotenuse is 10 feet long. To the nearest tenth of a foot, how long is the other leg?

CHALLENGE

29. Flor's house is 3 miles west and 4 miles north of the park. Joey's house is 2 miles east and 8 miles north of the park. To the nearest tenth of a mile, what is the distance between their houses?

3-8 Multistep Equations with Grouping Symbols

Name _____ Date _____

Solve: $4(x + 3) = 36$

Method 1 Use the Distributive Property.

$$\begin{aligned}
 4(x + 3) &= 36 & \text{Check: } 4(6 + 3) &\stackrel{?}{=} 36 \\
 4x + 12 &= 36 & 4(9) &\stackrel{?}{=} 36 \\
 4x + 12 - 12 &= 36 - 12 & 36 &= 36 \text{ True} \\
 4x &= 24 \\
 \frac{4x}{4} &= \frac{24}{4} \\
 x &= 6 \leftarrow \text{solution}
 \end{aligned}$$

Method 2 Use the inverse operations.

$$\begin{aligned}
 4(x + 3) &= 36 & \text{Check: } 4(6 + 3) &\stackrel{?}{=} 36 \\
 \frac{4(x + 3)}{4} &= \frac{36}{4} & 4(9) &\stackrel{?}{=} 36 \\
 x + 3 &= 9 & 36 &= 36 \text{ True} \\
 x + 3 - 3 &= 9 - 3 \\
 x &= 6 \leftarrow \text{solution}
 \end{aligned}$$

Solve each equation by using the Distributive Property.

Check your solution.

1. $4(a + 3) = 32$ $4a + 12 = 32$ $4a + 12 - 12 = 32 - 12$ $4a = 20; a = 5$ Check: $4(5 + 3) \stackrel{?}{=} 32$ $32 = 32$ True	2. $7(r - 7) = 49$	3. $-9(y + 1) = -9$	4. $0.6(r - 2) = 7.2$
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5. $\frac{1}{2}(c - 1) = 4$	6. $-\frac{1}{4}(n + 5) = 2$	7. $0.7(3 + n) = 14.7$	8. $0.13(d + 6) = 1.95$
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Solve each equation by using inverse operations. Check your solution.

9. $2(x + 8) = 48$ $\frac{2(x + 8)}{2} = \frac{48}{2}$ $x + 8 = 24$ $x + 8 - 8 = 24 - 8$ $x = 16$ Check: $2(16 + 8) \stackrel{?}{=} 48$ $48 = 48$ True	10. $6(s - 8) = -30$	11. $(c + 5)(-25) = 600$	12. $-9(k + 6) = -108$
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13. $0.4(s - 5) = 1.2$	14. $\frac{1}{10}(c + 3) = -\frac{9}{10}$	15. $(b + 5)2.5 = 40$	16. $-\frac{1}{5}(3 + a) = -4$
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Solve and check. (*Hint:* Isolate the group with the variable first.)

17. $\frac{a-6}{8} + 4 = 16$

$$\frac{a-6}{8} + 4 - 4 = 16 - 4$$

$$\frac{a-6}{8} = 12$$

$$\frac{a-6}{8} \cdot 8 = 12 \cdot 8$$

$$a - 6 = 96$$

$$a - 6 + 6 = 96 + 6$$

$$a = 102$$

18. $\frac{b+9}{3} + 5 = 28$

19. $\frac{n+7}{2} + 2 = -11$

20. $\frac{5d-2}{4} - 1 = -9$

21. $\frac{t+2}{2} - \frac{1}{4} = 1$

22. $\frac{d-0.5}{0.6} - 0.3 = 1$

23. $\frac{3r+5}{2} - 2 = 13$

24. $-\frac{7y+2}{6} - 3 = 22$

Problem Solving

Write an equation for each problem. Then solve.

25. The product of 8 and the difference between a number and 9 is 96. What is the number?

26. When 12 is added to half the sum of a number and 8, the result is 40. What is the number?

27. The difference between a number and 5, when multiplied by 3, is 36. What is the number?

28. When 10 is added to half the sum of a number and 8, the result is 30. What is the number?

MENTAL MATH

You can solve some problems with grouping symbols mentally.

29. Solve: $4(x - 2) = 20$

Think: $4 \cdot 5 = 20$. So $x - 2$ must equal 5 therefore, $x = 7$.

Solve each equation mentally.

30. $7(y + 2) = 28$

31. $5(t - 4) = 30$

32. $-8(5 + m) = 16$

33. $\frac{1}{2}(s + 8) = 7$