

Review Math for Students Entering Geometry

Solving Equations Write answers in Simplified Radical Form

1. $3(x-5)-(2x+1)=3-x$

2. $-\frac{3}{5}x = \frac{12}{5}$

3. $|x-2|=5$

4. $(x-3)(2x+1)=0$

5. $x^2-3x+2=0$

6. $x^2+5x=0$

7. $x^2=48$

8. $2x^2+8x=1$

9. $\frac{6x-3}{2x+1} = \frac{5}{x}$

10. $\frac{2x}{5} - \frac{5}{3} = \frac{x}{15}$

Simplifying Expressions – Perform the Indicated Operation

11. $(x^2+3x-4)-(3x^2+6x-4)$

12. $(3x^2y)(-4xy^3)$

13. $\frac{6x^3}{2x}$

14. $\left(\frac{2x^2}{3y}\right)^3$

15. $(2x-3)(3x+1)$

16. $\frac{x^2-9}{x+3}$

17. $\frac{15x^3}{36y^4} \cdot \frac{9xy^7}{35xy^3}$

18. $\frac{x^2-7x+10}{4x^2-19x-5} \cdot \frac{x^2-6x+9}{x^2-5x+6}$

19. $(2x+3)^2$

20. $\frac{x+9}{x^2+8x-9} \div \frac{1}{x^3-x^2}$

Solving Inequalities

21. $3x-8 \geq 4$

22. $4-5x \leq 2x-1$

23. $7 \leq 2x+3 \leq 18$

Simplifying Radicals

24. $\sqrt{(x-4)^2}$

29. $\frac{\sqrt{75}}{\sqrt{3}}$

25. $\sqrt{x^7}$

30. $\sqrt{12} + \sqrt{2}$

26. $\sqrt{12} \times \sqrt{8}$

31. $\frac{3}{\sqrt{3}} - 2\sqrt{27}$

27. $\sqrt{150}$

28. $\sqrt{\frac{72x^2}{27x^3}}$

Coordinate Geometry

<p>32. Find the slope of:</p> <p>a. $y = 2x + 5$</p> <p>b. line passing through (3,1) and (-2,4)</p> <p>c. line parallel to $y + 3 = 3(x + 5)$</p> <p>d. line perpendicular to $-3x + 2y = 1$</p>	<p>33. Find the slope intercept form of each line:</p> <p>a. $m = 2, b = -3$</p> <p>b. $m = \frac{1}{2}, (-2, 3)$</p>	<p>34. Find the slope Intercept, Point-Slope and Standard form of:</p> <p>a. line going through (2, 1) and (-4, 3)</p> <p>b. line that is parallel to $y - 1 = 4(x - 4)$ and passes through (-2, 1)</p>
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Solving Systems

35. Solve this system by graphing:

$$2x + 6y = 24$$

$$y = \frac{2}{3}x + 1$$

37. By Elimination/Linear Combinations

$$x + y = 8$$

$$-x + 2y = 7$$

36. By Substitution

$$2x - y = 5$$

$$-x + 3y = 5$$

Factoring – Factor each problem completely

38. $18x^3 - 9x$

40. $x^2 + 5x - 6$

39. $4x^2 - 16$

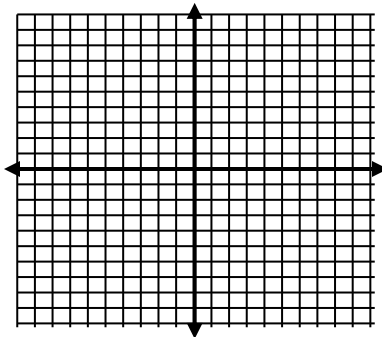
Word Problems – Define necessary variables, write equation(s), and solve

41. The length of a rectangle is 3 more than its width. Find its dimensions if its area equals 88.
42. Bill is 13 years older than Ben. In 9 years, Bill will be twice as old as Ben. How old is Ben?
43. The sum of three odd consecutive integers is less than 100. Find the greatest of the three integers.
44. Peter bought ice cream sodas and cakes. Ice cream sodas cost \$5 each, while cakes are only \$10 each. If Peter spent \$235 and only ended up with 30 items, how many ice cream sodas and cakes did he buy?
45. On a table there are 20 coins, some quarters and some dimes. Their value is \$3.05. How many of each coin are there?

EXAMPLES ~ Graph

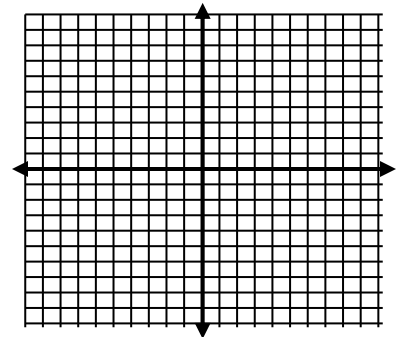
Using a Table of Values

46. $3x + y = 2$



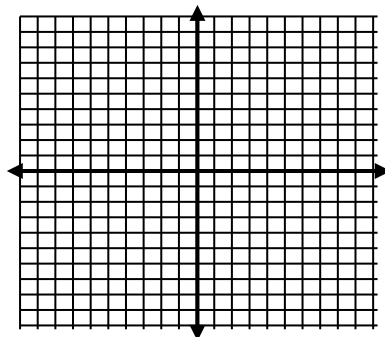
Using Intercepts

47. $2x + 4y = 8$



Using Slope Intercept Form

48. $y = \frac{2}{3}x - 8$



49. Tim scored 88, 92, 71, and 80 on 4 of his Algebra tests. He wants his end of the year average to be a 85. What is the lowest score he can receive on his 5th test?

Use the quadratic formula to solve the equation. Simplify radical answers.

50. $3x^2 + 6x = -2$

Solutions

1.

$$3(x-5)-(2x+1)=3-x$$

$$3x-15-2x-1=3-x$$

$$x-16=3-x$$

$$2x-16=3$$

$$2x=19$$

$$x=\frac{19}{2}$$

2.

$$-\frac{3}{5}x=\frac{12}{5}$$

$$\left(-\frac{5}{3}\right)\left(-\frac{3}{5}x\right)=\left(\frac{12}{5}\right)\left(-\frac{5}{3}\right)$$

$$x=-4$$

3.

$$|x-2|=5$$

$$x-2=5 \quad x-2=-5$$

$$x=7 \quad x=-3$$

$$(x-3)(2x+1)=0$$

$$x-3=0 \quad 2x+1=0$$

$$x=3 \quad 2x=-1$$

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

4.

$$(x-3)(2x+1)=0$$

$$x-3=0 \quad 2x+1=0$$

$$x=3 \quad 2x=-1$$

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

5.

$$x^2-3x+2=0$$

$$(x-2)(x-1)=0$$

$$x-2=0 \quad x-1=0$$

$$x=2 \quad x=1$$

6.

$$x^2+5x=0$$

$$x(x+5)=0$$

$$x=0 \quad x+5=0$$

$$x=-5$$

7.

$$x^2=48$$

$$\sqrt{x^2}=\sqrt{48}$$

$$x=\pm\sqrt{16\cdot 3}$$

$$x=\pm\sqrt{16}\cdot\sqrt{3}$$

$$x=\pm 4\sqrt{3}$$

8.

$$2x^2+8x=1$$

$$2x^2+8x-1=0$$

$$a=2, \quad b=8, \quad c=-1$$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

$$x=\frac{-(8)\pm\sqrt{(8)^2-4(2)(-1)}}{2(2)}$$

$$x=\frac{-8\pm\sqrt{72}}{4}$$

$$x=\frac{-8\pm\sqrt{36\cdot 2}}{4}$$

$$x=\frac{-8\pm 6\sqrt{2}}{4}$$

$$x=\frac{2(-4\pm 3\sqrt{2})}{2\cdot 2}$$

$$x=\frac{-4\pm 3\sqrt{2}}{2}$$

$$6x^2 - 3x = 10x + 5$$

$$6x^2 - 13x - 5 = 0$$

$$9. \quad (2x - 5)(3x + 1) = 0 \quad 6x^2 - 3x = 10x + 5$$

$$2x - 5 = 0, 3x + 1 = 0$$

$$x = -\frac{1}{3}, 2.5$$

$$\frac{2x}{5} - \frac{5}{3} = \frac{x}{15}$$

$$\left(15\right)_{\text{e}}^{\text{e}} \frac{2x}{5} - \left(15\right)_{\text{e}}^{\text{e}} \frac{5}{3} = \left(15\right)_{\text{e}}^{\text{e}} \frac{x}{15}$$

$$10. \quad 6x - 25 = x$$

$$5x = 25$$

$$x = 5$$

$$(x^2 + 3x - 4) - (3x^2 + 6x - 4)$$

$$11. \quad = x^2 + 3x - 4 - 3x^2 - 6x + 4$$

$$= -2x^2 - 3x$$

$$12. \quad (3x^2y)(-4xy^3)$$

$$= -12x^3y^4$$

$$13. \quad \frac{6x^3}{2x}$$

$$= 3x^2$$

$$\left(\frac{2x^2}{3y}\right)^3$$

$$14. \quad = \frac{2^3 x^6}{3^3 y^3}$$

$$= \frac{8x^6}{27y^3}$$

$$(2x - 3)(3x + 1)$$

$$15. \quad = 6x^2 + 2x - 9x - 3$$

$$= 6x^2 - 7x - 3$$

$$\frac{x^2 - 9}{x + 3}$$

$$x + 3$$

$$16. \quad = \frac{(x-3)(x+3)}{(x+3)} 17.$$

$$= x - 3$$

$$\frac{15x^3}{36y^4} \cdot \frac{9xy^7}{35xy^3} =$$

$$17. \quad \frac{\cancel{3} \cdot \cancel{3} \cdot \cancel{3} \cdot 3 \cdot x^4 \cdot \cancel{y^7}}{\cancel{3} \cdot 4 \cdot \cancel{3} \cdot 7 \cdot x \cdot \cancel{y^7}} =$$

$$\frac{3x^4}{28x} = \frac{3x^3}{28}$$

$$\frac{\cancel{(x-2)} \cancel{(x-5)} \cdot \cancel{(x-3)} (x-3)}{(4x+1) \cancel{(x-5)} \cdot \cancel{(x-3)} \cancel{(x-2)}}$$

$$18.$$

$$= \frac{x-3}{4x+1}$$

$$(2x+3)^2$$

$$19.$$

$$= (2x+3)(2x+3)$$

$$= 4x^2 + 6x + 6x + 9$$

$$= 4x^2 + 12x + 9$$

$$20. \quad \frac{x+9}{(x+9)(x-1)} * \frac{x^2(x-1)}{1} = x^2$$

$$3x - 8 \geq 4$$

$$21.$$

$$3x \geq 12$$

$$x \geq 4$$

$$4 - 5x \leq 2x - 1$$

$$4 - 7x \leq -1$$

$$22.$$

$$-7x \leq -5$$

$$x \geq \frac{5}{7}$$

$$7 \leq 2x + 3 \leq 18$$

23. $4 \leq 2x \leq 15$

$$2 \leq x \leq \frac{15}{2}$$

24. $\sqrt{(x-4)^2}$
 $= |x-4|$

25. $\sqrt{x^7}$
 $= \sqrt{x^6 \cdot x}$
 $= \sqrt{x^6} \cdot \sqrt{x}$
 $= x^3 \sqrt{x}$

26. $\sqrt{12} \cdot \sqrt{8}$
 $= \sqrt{4 \cdot 3} \cdot \sqrt{4 \cdot 2}$
 $= \sqrt{4} \cdot \sqrt{3} \cdot \sqrt{4} \cdot \sqrt{2}$
 $= 2 \cdot \sqrt{3} \cdot 2 \cdot \sqrt{2}$
 $= 4\sqrt{6}$

27. $\sqrt{150} =$
 $\sqrt{25 \cdot 6} =$
 $\sqrt{25} \cdot \sqrt{6} =$
 $5\sqrt{6}$

28. $\sqrt{\frac{72x^2}{27x^3}} =$
 $\sqrt{\frac{9 \cdot 8 \cdot x^2}{9 \cdot 3 \cdot x^3}} =$
 $\sqrt{\frac{8}{3x}} =$
 $\frac{\sqrt{4 \cdot 2}}{\sqrt{3x}} \cdot \frac{\sqrt{3x}}{\sqrt{3x}} =$
 $\frac{2\sqrt{2} \cdot \sqrt{3x}}{3x} =$
 $\frac{2\sqrt{6x}}{3x}$

$$\begin{aligned}
 & \frac{\sqrt{75}}{\sqrt{3}} \\
 29. & = \sqrt{\frac{75}{3}} \\
 & = \sqrt{25} \\
 & = 5
 \end{aligned}$$

$$\begin{aligned}
 & \sqrt{12} + \sqrt{3} = \\
 30. & \sqrt{4 \cdot 3} + \sqrt{3} = \\
 & 2\sqrt{3} + \sqrt{3} = \\
 & 3\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 & \frac{3}{\sqrt{3}} - 2\sqrt{27} = \\
 & \frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} - 2\sqrt{9 \cdot 3} = \\
 31. & \frac{3\sqrt{3}}{3} - 2 \cdot 3\sqrt{3} = \\
 & \sqrt{3} - 6\sqrt{3} = \\
 & -5\sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 32. & \text{ a. } m = 2 \\
 & \text{ b. } m = \frac{-3}{5}
 \end{aligned}$$

$$\begin{aligned}
 & \text{ c. } m = 3 \\
 & \text{ d. } 2y = 3x + 1 \\
 & \quad y = \frac{3}{2}x + \frac{1}{2} \\
 & \quad m = \frac{3}{2}
 \end{aligned}$$

$$\begin{aligned}
 33. & \text{ a. } y = 2x + -3 \\
 & \text{ b. } y = \frac{1}{2}x + b \\
 & \quad -3 = \frac{1}{2}(-2) + b \\
 & \quad -3 = -1 + b \\
 & \quad -2 = b \\
 & \quad y = \frac{1}{2}x + -2
 \end{aligned}$$

34.

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

$$y = \frac{-1}{3}x + b$$

$$1 = \frac{-2}{3} + b$$

$$b = \frac{5}{3}$$

$$y = \frac{-1}{3}x + \frac{5}{3}$$

$$2x + 3y = 5$$

$$y - 1 = \frac{-1}{3}(x - 2)$$

$$B. y = 4x + b$$

$$1 = -8 + b$$

$$9 = b$$

$$y = 4x + 9$$

$$-4x + y = 9$$

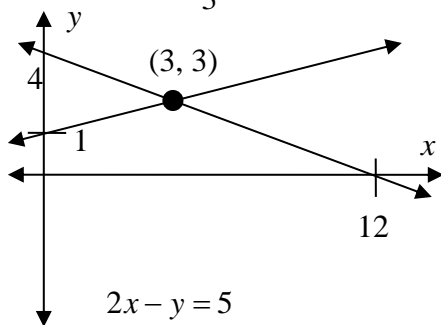
$$y - 1 = 4(x + 2)$$

$$2x + 6y = 24$$

$$6y = -2x + 24 \quad y = \frac{2}{3}x + 1$$

$$35. \quad y = -\frac{1}{3}x + 4 \quad m = \frac{2}{3}$$

$$m = -\frac{1}{3}, b = 4 \quad b = 1$$



$$2x - y = 5$$

$$2x = y + 5$$

$$2x - 5 = y$$

$$-x + 3(2x - 5) = 5$$

$$-x + 6x - 15 = 5$$

$$5x - 15 = 5$$

36.

$$5x = 20$$

$$x = 4$$

$$2(4) - 5 = y$$

$$8 - 5 = y$$

$$3 = y$$

$$(4, 3)$$

$$x + y = 8$$

$$\underline{-x + 2y = 7}$$

$$3y = 15$$

37. $y = 5$

$$x + 5 = 8$$

$$x = 3$$

$$(3, 5)$$

$$81x^3 - 9x =$$

38. $9x(9x^2 - 1) =$

$$9x(3x - 1)(3x + 1)$$

$$4x^2 - 16$$

39. $= 4(x^2 - 4)$

$$= 4(x - 2)(x + 2)$$

40. $x^2 + 5x - 6 =$

$$(x - 1)(x + 6)$$

41. $w = \text{width}$

$$w + 3 = \text{length}$$

$$\text{Area} = \text{length} \bullet \text{width}$$

$$w(w + 3) = 88$$

$$w^2 + 3w - 88 = 0$$

$$(w + 11)(w - 8) = 0$$

$$w + 11 = 0 \quad w - 8 = 0$$

$$w = -11 \quad w = 8$$

Answer: width cannot be negative, so width is 8 and length is 11

42. Now

$$x = \text{Ben's age now}$$

$$y = \text{Bill's age now}$$

$$x + 13 = y$$

In 9 years

$$x + 9 = \text{Ben's age in 9 years}$$

$$y + 9 = \text{Bill's age in 9 years}$$

$$y + 9 = 2(x + 9)$$

$$y + 9 = 2x + 18$$

$$y = 2x + 9$$

(continued on next page)

42 (continued).

By substitution

$$x + 13 = 2x + 9$$

$$-x + 13 = 9$$

$$-x = -4$$

$$x = 4$$

$$y = 2(4) + 9$$

$$y = 8 + 9$$

$$y = 17$$

Answer: Ben is 4 years old now and Bill is 17 years old now

43.

x = first consecutive odd integer

$x + 2$ = 2nd consecutive odd integer

$x + 4$ = 3rd consecutive odd integer

$$x + (x + 2) + (x + 4) < 100$$

$$3x + 6 < 100$$

$$3x < 94$$

$$x < 31\frac{1}{3}$$

31 is the greatest integer that is less than $31\frac{1}{3}$ so the three integers are 31, 33, and 35. (The sum of these

three is 99 which is just less than 100)

Answer: 35 is the greatest of these three integers

44.

Ice cream sodas = x ; cakes = y

$$X + y = 30$$

$$5x + 10y = 235$$

$$-5x + -5y = -150$$

$$5x + 10y = 235$$

$$5y = 85$$

$$Y = 17$$

17 cakes and 13 ice cream sodas

45. q = number of quarters
 d = number of dimes
 $25q$ = number of cents in q quarters
 $10d$ = number of cents in d dimes

$$q + d = 20$$

$$\underline{25q + 10d = 305}$$

$$(10)q + (10)d = (10)20$$

$$\underline{(-1)25q + (-1)10d = (-1)305}$$

$$10q + 10d = 200$$

$$\underline{-25q - 10d = -305}$$

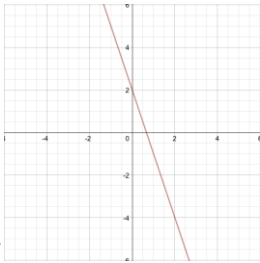
$$-15q = -105$$

$$q = 7$$

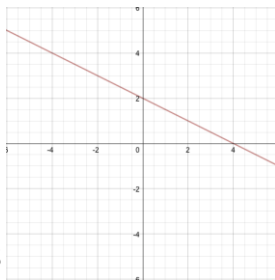
$$7 + d = 20$$

$$d = 13$$

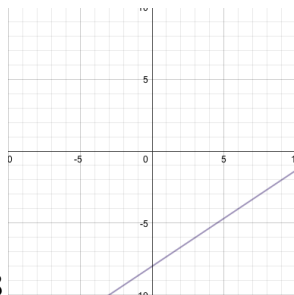
Answer: There are 7 quarters and 13 dimes on the table.



46. $3x + y = 2$



47. $2x + 4y = 8$



48. $y = \frac{2}{3}x - 8$

49.

$$\frac{88 + 92 + 71 + 80 + x}{5} = 85$$

$$\frac{331 + x}{5} = 85$$

$$331 + x = 425$$

$$x = 94\%$$

50. $3x^2 + 6x = -2$

$$3x^2 + 6x + 2 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(6) \pm \sqrt{(6)^2 - 4(3)(2)}}{2(3)}$$

$$x = \frac{-6 \pm \sqrt{36 - 24}}{6}$$

$$x = \frac{-6 \pm \sqrt{12}}{6}$$

$$x = \frac{-6 \pm \sqrt{4} \cdot \sqrt{3}}{6}$$

$$x = \frac{-6 \pm 2\sqrt{3}}{6}$$

$$x = \frac{-6}{6} \pm \frac{2\sqrt{3}}{6}$$

$$x = -1 \pm \frac{\sqrt{3}}{3}$$