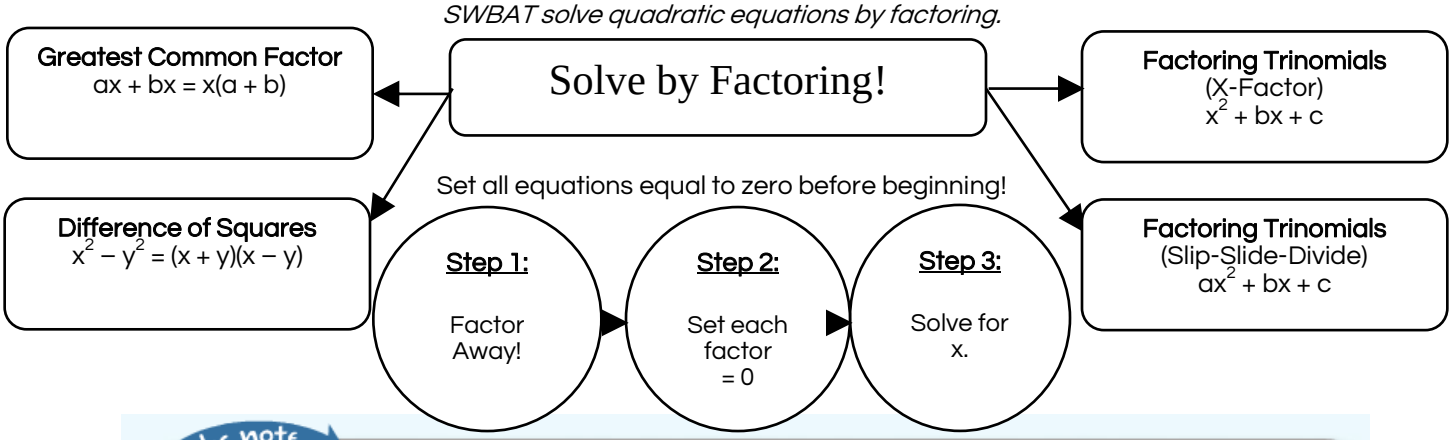
Math 1

Solving by Factoring

Chapter 9

SWBAT solve quadratic equations by factoring.



take note

Property Zero-Product Property

For any real numbers a and b, if $ab = 0$, then $a = 0$ or $b = 0$.

Example If $(x + 3)(x + 2) = 0$, then $x + 3 = 0$ or $x + 2 = 0$.

Example 1: What are the solutions of the equation $(4t + 1)(t - 2)$

Practice:

a. $(x + 1)(x - 5) = 0$

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

c. $(2y + 1)(y + 14) = 0$

d. $(7n - 2)(5n - 4) = 0$

Example 2: What are the solutions of the equation: $x^2 + 8x + 15 = 0$

Practice:

a. $m^2 - 5m - 14 = 0$

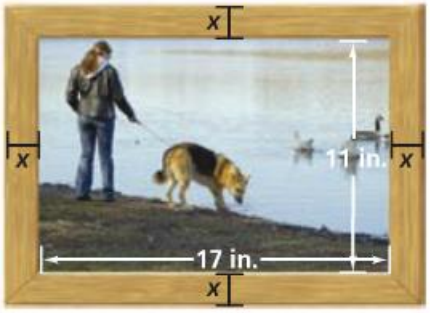
b. $p^2 + p - 20 = 0$

c. $2a^2 - 15a + 18 = 0$

Example 3: What are the solutions of $4x^2 - 21x - 18$

Example 4: Real World Problems

Photography You are constructing a frame for the rectangular photo shown. You want the frame to be the same width all the way around and the total area of the frame and photo to be 315 $in.^2$. What should the outer dimensions of the frame be?



Know Need Plan

Practice:

a. Suppose in the problem above the total area is 391 in^2

b. You are making a rectangular table. The area of the table should be 10 ft^2. You want the length of the table to be 1 ft shorter than twice its width. What should the dimensions of the table be?

c. Jason has a patio of uniform width around the perimeter of his rectangular pool.. The pool measures 22 ft by 12 ft. If the area of the pool and the patio is 504 $ft.^2$ what is the width of the patio?

Your turn: Solve each of the following by factoring. Check your solutions by graphing.

1. $x(x+4) = 0$
2. $(2x + 1)(3x - 4) = 0$
3. $x(3x + 9) = 0$
4. $x^2 - 64 = 0$
5. $-x^2 = -121$
6. $3x^2 - 81 = 2x^2$
7. $-3x^2 = 21x + 36$
8. $x^2 - 12x + 36 = 0$
9. $x^2 - 2x = 15$
10. $3x^2 + 31x + 36 = 0$
11. $2x^2 - 18x = -24x$
12. $5x^2 + 32x = -28x$
13. $6x^2 + 11x + 4 = 0$
14. $8x^2 + 18x + 7 = 0$
15. $45x^2 + 56x = -16$

16. A box shaped like a rectangular prism has a volume of 280 in ^{3}. Its dimension are 4 in. by (n + 2) in. by (n + 5). Find n.