



Warm Up

Prove



What does prove mean in algebra???

$$4x(x+2) - x(3+4x) = 5x$$

$$\cancel{4x^2} + 8x - 3x - \cancel{4x^2} = 5x$$
$$5x = 5x$$

✓

Unit 2. Quadratics

Factoring (day 1)



factor-

Something that's multiplied
to give you the product

STEPS OF FACTORING:

1. Take out a GCF (greatest common factor)

Examples:

a) $6x - x^3 - x^2$

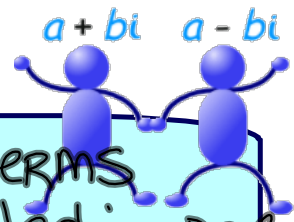
$\underbrace{2 \cdot 3}_{\text{circled}} \quad \underbrace{X \cdot X \cdot X}_{\text{circled}} \quad \underbrace{X \cdot X}_{\text{circled}}$

$$X(6 - x^2 - x)$$

b) $12x^4 + 10x^3 - 12x^2$

$\underbrace{2 \cdot 6}_{\text{circled}} \quad \underbrace{2 \cdot 5}_{\text{circled}} \quad \underbrace{2 \cdot 6}_{\text{circled}}$
 $\underbrace{X \cdot X \cdot X}_{\text{circled}} \quad \underbrace{X \cdot X \cdot X}_{\text{circled}} \quad \underbrace{X \cdot X}_{\text{circled}}$

$$2x^2(6x^2 + 5x - 6)$$

Steps of Factoring Continued:2. Look for the difference of two perfect squares

conjugate pair- binomials w/ same terms
except the second is negated in one

Examples:

a) $9x^2 - \frac{4}{9}$

$$\left(3x + \frac{2}{3}\right)\left(3x - \frac{2}{3}\right)$$

b) $x^8 - 16$

$$\begin{array}{c} (x^4 + 4)(x^4 - 4) \\ \downarrow \quad \underbrace{\hspace{1.5cm}} \\ (x^4 + 4)(x^2 + 2)(x^2 - 2) \end{array}$$

Steps of Factoring Continued Still...

3. Factor the trinomial (reverse FOIL)

example: $x^2 + 7x + 12$

$$(x+3)(x+4)$$

$x^2 + bx + c$
 (product of c ,
 Sum of b)

More examples:

a) $x^2 - 5x + 6$

$$(x-2)(x-3)$$

b) $2x^2 + 10x - 12$

$$2(x^2 + 5x - 6)$$

$$2(x+6)(x-1)$$

2#s	$\times 12$	$+ 7$
2, 6	12 ✓	8x
3, 4	12 ✓	7 ✓

2#s	$\times 6$	$+ -5$
2, 3	6	5x
-2, -3	6	-5 ✓

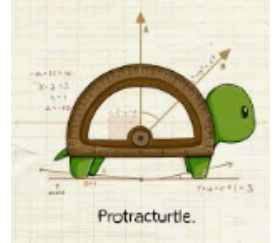
Now to apply this to radical equations...

$$\sqrt{3x+16} = (x+2)^2$$

$$\sqrt{3x+16} = (x+2)(x+2)$$

$$\begin{array}{r} 3x+16 = x^2+4x+4 \\ -3x-16 \quad -3x-16 \\ \hline 0 = x^2+1x-12 \\ 0 = (x+4)(x-3) \end{array}$$

$x+4=0$ $x-3=0$
 $x=-4, 3$ {3}



$$\sqrt{5x+29} = x+3$$

$$\sqrt{x+3} = (3-x)^2$$

$$\sqrt{x+3} = (3-x)(3-x)$$

$$\begin{array}{r} x+3 = 9-6x+x^2 \\ -x-3 \quad -3-1x \\ \hline 0 = x^2-7x+6 \end{array}$$

$$0 = x^2 - 7x + 6$$

$$0 = (x-1)(x-6)$$

$x-1=0$ $x-6=0$
 $x=1, 6$ {1}

REGENTS QUESTION 6/2016

The solution set for the equation $\sqrt{56-x} = x$ is:

1) ~~{-8, 7}~~

2) ~~{-7, 8}~~

3) {7}

4) {}

$$\sqrt{56-7} = 7$$

$$\sqrt{49} = 7$$

$$7 = 7 \checkmark$$

$$56-x = x^2$$

$$0 = x^2 + x - 56$$

$$0 = (x+8)(x-7)$$

$$x = -8, 7$$

Homework: p. 27 #30 - 32; p. 113 #24-25

In 27-39, factor each polynomial completely.

30. $4ax^2 + 4ax - 24a$

31. $12c^2 - 3$

32. $x^4 - 81$

Developing Skills

In 3-38, solve each equation for the variable, check, and write the solution set.

24. $3 - b = \sqrt{3b - 11}$

25. $x = 1 + \sqrt{x + 11}$