

## Algebra 2 - Unit 2.7: Solving using "Slide and Divide"

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Refresher over Unit 1 Lesson 5. You should already have this stuff written in your notes. Just focus on paying attention.

Factoring when a does not equal 1:

**Slide and Divide** method!

Example: Factor  $6x^2 - x - 2$

Step 1: Slide the 6 over to the 2 (multiply)

$$x^2 - 1x - 12$$

Step 2: Factor using old method

$$(x - \frac{4}{6})(x + \frac{3}{6})$$

Step 3: Divide the numbers by the number you slid.

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

Step 4: Reduce

Step 5: Move any denominators in front of the x they are with.

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

Another example from Unit 1 Lesson 5:

Ex: Factor  $4x^2 + 4x - 3$

1. Slide

$$x^2 + 4x - 12$$

$$\left(x + \frac{6}{4}\right)\left(x - \frac{2}{4}\right)$$

2. Factor

3. Divide

$$\left(x + \frac{3}{2}\right)\left(x - \frac{1}{2}\right)$$

4. Reduce

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

5. Move Denom.

Solving Equations:

The steps we follow are the same as the steps we have been using, the only difference is that this time "Slide and divide" will be needed to factor. You should already have these steps written down from last lesson's notes (U2.6)

Solving Quadratic Equations:

1. Get all of your terms on one side so that it is equal to 0.
2. Factor using any method.
3. Set each factor equal to 0.
4. Solve each of those equations.

Ex: Solve  $3x^2 + 8x = 3$   
 $-3 \quad -3$

Slide  
&  
Divide

$$3x^2 + 8x - 3 = 0$$

$$x^2 + 8x - 9$$

$$(x + \frac{9}{3})(x - \frac{1}{3})$$

$$(x + 3)(x - \frac{1}{3})$$

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

Set = 0

↓

 $x + 3 = 0$   
 $x = -3$

↓

 $3x - 1 = 0$   
 $3x = 1$   
 $x = \frac{1}{3}$

$x = -3$        $x = \frac{1}{3}$

Now you try:  $2x^2 - 15 = 7x$

$-7x - 7x$

$2x^2 - 7x - 15 = 0$

adds  $x^2 - 7x - 30$  mult.

$-10 \cdot 3$

$-10 + 3$

$(x - \frac{10}{2})(x + \frac{3}{2})$

$(x - 5)(2x + 3) = 0$

$x - 5 = 0$

$2x + 3 = 0$

$x = 5$

$2x = -3$

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

Sometimes you need to move multiple terms around and combine them, just like last lesson.

Ex: Solve  $7x^2 - 2x = 3 + 3x^2 - 3x$

*(Handwritten annotations: a red '-3' above the right-hand side, a yellow circle around the '+3x^2' term, and vertical yellow lines through the '+3x^2' and '-3x' terms on the right-hand side.)*

*(Handwritten annotations: '-3x^2 + 3x' written in green below the left-hand side, and '-3 -3x^2 + 3x' written in blue below the right-hand side.)*

$$4x^2 + x - 3 = 0$$

Slide & Divide

$$x^2 + x - 12$$

$$(x + \frac{4}{4})(x - \frac{3}{4})$$

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

$$x + 1 = 0 \quad 4x - 3 = 0$$

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

Last Example:  $6x^2 - x + 4 = -4x^2 + 5 + 2x$   
 $+4x^2 - 2x - 5$      ~~$+4x^2 - 5 - 2x$~~

$$10x^2 - 3x - 1 = 0$$

Slide & Divide

Slide  $\rightarrow x^2 - 3x - 10$

factor  $\rightarrow (x - 5)(x + 2)$

Divide  $\rightarrow \frac{x-5}{10} \frac{x+2}{10}$

Reduce  $\rightarrow (x - \frac{1}{2})(x + \frac{1}{5})$

move Denominators  $\rightarrow (2x - 1)(5x + 1) = 0$

$$2x - 1 = 0 \quad 5x + 1 = 0$$

$x = \frac{1}{2}$	$x = -\frac{1}{5}$
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Homework:

U2.7 Worksheet

QA over this tomorrow. Expect 2 problems instead of the usual 3.