6 - completing the square.docx

Wednesday, January 22, 2020 9:15 AM

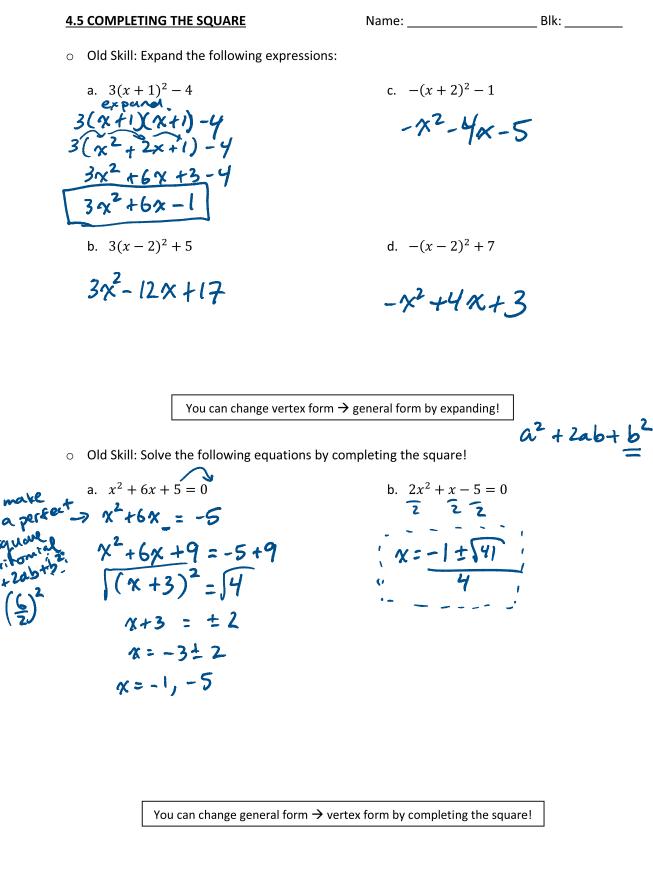


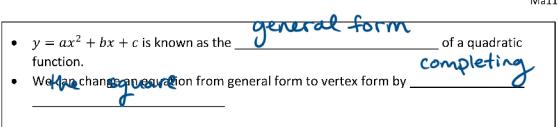
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• Example 1: Change $y = x^2 + 8x + 12$ into vertex form.

(8)2	$y = x^{2} + 8x + 12$	Look at the first 2 terms
$\left(\frac{8}{2}\right)^2$	$y = (x^2 + 8x + 16) = 16 + 12$	\pm the magic number' that makes a perfect square in trinomial form
	$y = (x+4)^2 - 16 + 12$	Rewrite as a perfect square binomial
	$y = (x+4)^2 - 4$	Clean it up
	y = w(x-r) + rg	

• Example 2: What if a > 1 ?

Change $y = 3x^2 - 12x + 7$ into vertex form.

	$y = (3x^2 - 12x) + 7$	Look at the first 2 terms
	$y = 3(x^2 - 4x) + 7$	Factor out a from the first 2 terms
(4)	$y = 3(x^2 - 4x + 4 - 4) + 7$	Add the 'magic number' that makes a perfect square in trinomial form
	$y = 3(\chi^2 - 4\chi + 4) - 12 + 7$	Subtract the 'magic number' times <i>a</i>
	$y = 3(x - 2)^2 - 12 + 7$	Rewrite as a perfect square binomial
	$y = 3(x - 2)^2 - 5$	Clean it up

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• Example 3: What if a < 1 ?

Change $y = -4x^2 + 9x - 2$ into vertex form.

	$y = -4x^2 + 9x - 2$	Look at the first 2 terms
(081) (154) (154)	$y = -4(x^2 - \frac{9}{4}x) - 2$	Factor out <i>a</i> from the first 2 terms ***WATCH YOUR SIGNS!!***
	$y = -4(\chi^2 - \frac{9}{4}\chi + \frac{81}{64} - \frac{81}{64}) - 2$	Add the 'magic number' that makes a perfect square in trinomial form Subtract the 'magic number' times a
	$y = -4(x^{2} - \frac{9}{4}x + \frac{81}{4}) + \frac{81}{6} - 2$	***WATCH YOUR SIGNS!!***
	$y = -4(x^2 - \frac{9}{8})^2 + \frac{81}{16} - \frac{32}{16}$	Rewrite as a perfect square binomial
	$y = -4(\chi^2 - \frac{9}{8})^2 + \frac{49}{16}$	Clean it up

o Example 4: What if 0 < |a| < 1 ?

Change $y = \frac{1}{5}x^2 + 2x - 1$ into vertex form.

	$y = \frac{1}{5}x^2 + 2x - 1$	Look at the first 2 terms	
	$y = \frac{1}{5}(x^2 + 10x) - 1$	Factor out <i>a</i> from the first 2 terms ***FACTOR OUT, NOT MULTIPLY***	
$(\frac{10}{2})^2$	$y = \frac{1}{5} (x^2 + 10x + 25 - 25) - 1$	Add the 'magic number' that makes a perfect square in trinomial form	
(2)	y= 1/5 (x2+10x+25)-5-1	Subtract the 'magic number' times <i>a</i>	
	$y = \frac{1}{5}(x + 5)^2 - 5 - 1$	Rewrite as a perfect square binomial	
	$y = \frac{1}{5} (x + 5)^2 - 6$	Clean it up	
	{Assignment. p. 315 #3-5, 7,8, 10, 11}		