Questions on 3.6 HW?

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1. Find the x-intercept of each equation below. Write your answer as an ordered pair. Consider how $(x, 0)$
the format of the given equation either facilitates for inhibits your work.

a. $3x + 4y = 12$ b. $y = 5x - 3$ $y - 5 = -4(x + 1)$
$$0 - 5 = -4x - 4$$
$$-5 = -4x - 4$$

d. $y = -4x + 1$ e. $y - 6 = 2(x + 7)$ f. $5x - 2y = 10$ $+4$
$$0 = -4x + 1$$
$$\frac{-1}{-4} \quad \frac{1}{-4} \qquad \frac{-1 = -4x}{-4}$$

2. Which of the linear equation formats above facilitates your work in finding x-intercepts? Why? 4
$$\frac{-1}{-4} = \frac{-4x}{-4}$$
$$\boxed{\frac{1}{4} = x}$$

3. Using the same equations from question 1, find the y-intercepts. Write your answers as ordered $\boxed{\frac{1}{4} = x}$
pairs $\left(\frac{1}{4}, 0\right)$ $\left(\frac{1}{4}, 0\right)$

a. $3x + 4y = 12$ b. $y = 5x - 3$ c. $y - 5 = -4(x + 1)$

d. $y = -4x + 1$ e. $y - 6 = 2(x + 7)$ f. $5x - 2y = 10$

4. Which of the formats above facilitate finding the y-intercept? Why?

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3. Using the same equations from question 1, find the y-intercepts. Write your answers as ordered pairs $(0, y)$

a.　$3x + 4y = 12$

$3 \cdot 0 + 4y = 12$

$\dfrac{4y}{4} = \dfrac{12}{4}$

$\boxed{y = 3}$

$(0, 3)$

b.　$y = 5x - 3$

c.　$y - 5 = -4(x + 1)$

d.　$y = -4x + y$

e.　$y - 6 = 2(x + 7)$

f.　$5x - 2y = 10$

4. Which of the formulas above facilitate finding the y-intercept?　Why?

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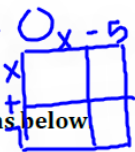File   Edit   View   Window   Help

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**For each of the given quadratic equations, (a) describe the rectangle the equation fits with.
(b) What constraints have been placed on the dimensions of the rectangle?**

5. $x^2 + 7x - 170 = 0$ 6. $x^2 + 15x - 16 = 0$

80

$8, ^-10$
$-8, 10$
$-40, 2$

7. $x^2 + 2x - 35 = 0$ 8. $x^2 + 10x - 80 = 0$

$(x - 5)(x + 7) = 0$ $_{x - 5}$ $(x x) = 0$

$40, ^-2$
$20, ^-4$
$-20, 4$

Solve the quadratic equations below

9. $x^2 + 7x - 170 = 0$ 10. $x^2 + 15x - 16 = 0$

$5, -16$
$-5, 16$

11. $x^2 + 2x - 35 = 0$ 12. $x^2 + 10x - 80 = 0$

Go

Topic: Factoring Expressions

Write each of the expressions below in factored form.

13. $x^2 - x - 132$ 14. $x^2 - 5x - 36$ 15. $x^2 + 5x + 6$

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Solve the quadratic equations below.

9. $x^2 + 7x - 170 = 0$

10. $x^2 + 15x - 16 = 0$

11. $x^2 + 2x - 35 = 0$

$(x+7)(x-5)=0$

$x = -7, 5$

12. $x^2 + 10x - 80 = 0$

$a = 1$
$b = 10$
$c = -80$

$x = \dfrac{-10 \pm \sqrt{(10)^2 - 4 \cdot 1 \cdot -80}}{2 \cdot 1}$ *

$x = 5.2, -15.2$

Go

Topic: Factoring Expressions

Write each of the expressions below in factored form.

13. $x^2 - x - 132$

14. $x^2 - 5x - 36$

15. $x^2 + 5x + 6$

16. $x^2 + 13x + 42$

17. $x^2 + x - 56$

18. $x^2 - x = x(x-1)$

19. $x^2 - 8x + 12$

20. $x^2 - 10x + 25$

21. $x^2 + 5x = x(x \quad)$

$2x - 4$

$2(x-2)$

* $\dfrac{-10 \pm \sqrt{100 + 320}}{2} = \dfrac{-10 \pm \sqrt{420}}{2}$

$-\dfrac{10 + \sqrt{420}}{2}$ & $-\dfrac{10 - \sqrt{420}}{2}$

5.2 & -15.2

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3.6 Curbside Rivalry
A Solidify Understanding Task   pg.38

4. Consider Carlos' quadratic equation where $n = 8$, so $x^2 + 8x - 48 = 0$. How can we use our work with quadratic functions like $y = x^2 + 8x - 48$ to help us solve the quadratic equation $x^2 + 8x - 48 = 0$? Describe at least two different strategies you might use, and then carry them out. Your strategies should give you solutions to the equation as well as a solution to the question Carlos is trying to answer in #2.

$$(x - 4)(x + 12) = 0$$
$$x = 4, -12$$

$(4, 0)$
$(-12, 0)$

5. Now consider Clarita's quadratic equation where $n = 13$, so $x^2 + 13x - 48 = 0$. Describe at least two different strategies you might use to solve this equation, and then carry them out. Your strategies should give you solutions to the equation as well as a solution to the question Clarita is trying to answer in #3.

$$(x - 3)(x + 16) = 0$$
$$x = 3, -16$$

$(3, 0)$
$(-16, 0)$

-4, 12	8
4, -12	-8
2, -24	-22
-2, 24	22
-8, 6	-2
8, -6	2
3, -16	-13
-3, 16	13

3.7 Perfecting My Quads
A Practice Understanding Task

Carlos and Clarita, Tia and Tehani, and their best friend Zac are all discussing their favorite methods for solving quadratic equations of the form $ax^2 + bx + c = 0$. Each student thinks about the related quadratic function $y = ax^2 + bx + c$ as part of his or her strategy.

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Carlos: "I like to make a table of values for x and find the solutions by inspecting the table."

Clarita: "I like to write the equation in factored form, and then use the factors to find the solutions."

Tia: "I like to treat it like a quadratic function that I am trying to put in vertex form by completing the square. I can then use a square root to undo the squared expression."

Tehani: "I also like to treat it like a quadratic function, but I use the quadratic formula to find the solutions."

Zac: "I like to graph the related quadratic function and use my graph to find the solutions."

Demonstrate how each student might solve each of the following quadratic equations.

Solve:	~~Carlos' Strategy~~	Zac's Strategy
$x^2 - 2x - 15 = 0$		$f1(x) = x^2 - 2x - 15$ look for x-int. $x = -3, 5$

Clarita's Strategy	Tia's Strategy	Tehani's Strategy
$(x-5)(x+3) = 0$ $x = 5, -3$	$x^2 - 2x - 15 = 0$ $\quad +16 \quad +16$ $x^2 - 2x + 1 = 16$ $(x-1)(x-1) = 16$ $(x-1)^2 = 16$ $\quad -16 \quad -16$ $(x-1)^2 - 16 = 0$ vertex: $(1, -16)$	$a = 1$ $b = -2$ $c = -15$ $x = \dfrac{-(-2) \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot -15}}{2 \cdot 1}$

$$\sqrt{(x-1)^2} = \sqrt{16}$$
$$x - 1 = \pm 4$$
$$+1 \quad\quad +1$$
$$x = 1 \pm 4$$
$$x = 1 + 4 \text{ & } 1 - 4$$
$$\boxed{x = 5, -3}$$

$$x = \frac{2 \pm \sqrt{4 + 60}}{2}$$
$$x = \frac{2 \pm \sqrt{64}}{2}$$
$$x = \frac{2 \pm 8}{2}$$
$$x = \frac{2 + 8}{2} \text{ & } \frac{2 - 8}{2}$$
$$x = \frac{10}{2} \text{ & } \frac{-6}{2}$$
$$\boxed{x = 5, -3}$$

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Solve: $2x^2 + 5x - 12 = 0$	Carlos' Strategy	Zac's Strategy
Clarita's Strategy	Tia's Strategy	Tehani's Strategy

Solve: $x^2 + 4x - 8 = 0$	Carlos' Strategy	Zac's Strategy
Clarita's Strategy	Tia's Strategy	Tehani's Strategy

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Solve: $8x^2 + 2x = 3$	Carlos' Strategy	Zac's Strategy
Clarita's Strategy	Tia's Strategy	Tehani's Strategy

Describe why each strategy works.

As the students continue to try out their strategies, they notice that sometimes one strategy works better than another. Explain how you would decide when to use each strategy.

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Here is an extra challenge. How might each student solve the following system of equations?

Solve the system:	Carlos' Strategy	Zac's Strategy
$y_1 = x^2 - 4x + 1$ $y_2 = x - 3$		
Clarita's Strategy	Tia's Strategy	Tehani's Strategy

Homework

3.7 MVP "Ready, Set, Go"

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