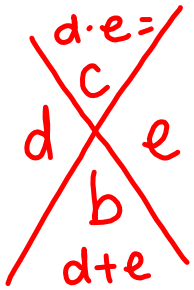
Starter

Get out your 2.7 packet and make sure your "Ready, Set, Go" homework is finished. We will go over any questions you have, and will be turning it in soon!

Hang onto:

- Chapter Summaries from textbook
- Module 2 packets (2.1 - 2.8)

ax^2+bx+c Standard Form $\longrightarrow$ pg 44 $(x-d)(x-e)$ Factored Form



The area of a rectangle is given in the form of a trinomial expression. Find the equivalent expression that shows the lengths of the two sides of the rectangle.

9. x^2+9x+8 — 8×1, $8+1=9$ — $(x+8)(x+1)$

10. x^2-6x+8 — -2×-4, $-2-4=-6$ — $(x-2)(x-4)$

11. x^2-2x-8 — $(x\ \ )(x\ \ )$

12. x^2+7x-8 — $(x\ \ )(x\ \ )$

13. $x^2-11x+24$ — $(x-3)(x-8)$

14. $x^2-14x+24$ — $(x-2)(x-12)$

15. $x^2-25x+24$ — $(x-24)(x-1)$

16. $x^2-10x+24$ — $(x-6)(x-4)$

17. $x^2-2x-24$ — $(x-6)(x+4)$

18. $x^2-5x-24$ — $(x+3)(x-8)$

19. $x^2+5x-24$ — $(x-3)(x+8)$

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

21. x^2-25 — $x^2+0x-25$, $(x+5)(x-5)$

22. $x^2-2x-15$

23. $x^2+10x-75$

24. $x^2-20x+51$

25. $x^2+14x-32$ — -25, 5×-5, $5-5=0$

26. x^2-1 — x^2+0x-1, $(x+1)(x-1)$; -1, -1×1, $-1+1=0$

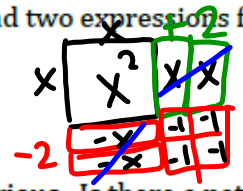
27. x^2-2x+1

28. $x^2+12x-45$

Finish 2.7

9. One customer had an unusual request. She wanted a block that is extended 2 inches on one side and decreased by 2 inches on the other. One of the employees thinks that this rectangle will have the same area as the original square since one side was decreased by the same amount as the other side was increased. What do you think? Use a diagram to find two expressions for the area of this block.

$(x+2)(x-2) = x^2+2x-2x-4$
$= x^2-4$



10. The result of the unusual request made the employee curious. Is there a pattern or a way to predict the two expressions for area when one side is increased and the other side is decreased by the same number? Try modeling these two problems, look at your answer to #8, and see if you can find a pattern in the result.

a. $(x+1)(x-1) = x^2-x+x-1$
$= x^2-1$

b. $(x+3)(x-3) = x^2-3x+3x-9$
$= x^2-9$

11. What pattern did you notice? What is the result of $(x+a)(x-a)$?

"difference of squares" x^2-a^2

$x^2-16=(x+4)(x-4)$

12. Some customers want both sides of the block reduced. Draw the diagram for the following blocks and find a trinomial expression for the area of each block. Use algebra to verify the trinomial expression that you found from the diagram.

a. $(x-2)(x-3)$

b. $(x+1)(x-4)$

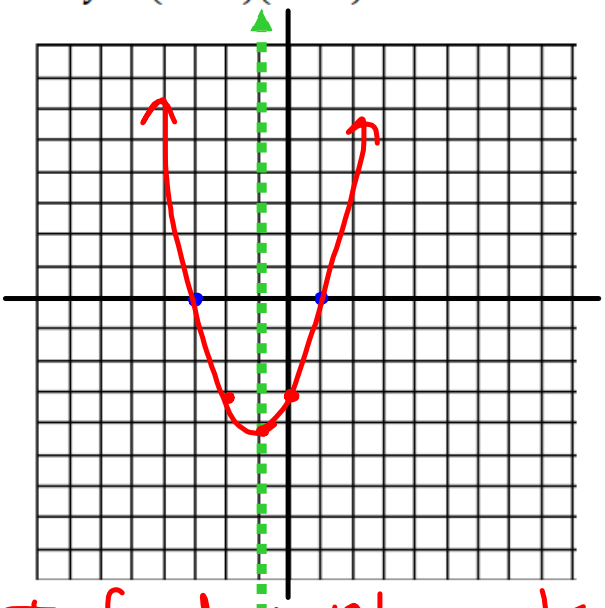
13. Look back over all the equivalent expressions that you have written so far, and explain how to tell if the third term in the trinomial expression ax^2+bx+c will be positive or negative.

2.8 Lining Up Quadratics

A Practice Understanding Task

Graph each function and find the vertex, the y-intercept and the x-intercepts. Be sure to properly write the intercepts as points.

1. $y = (x - 1)(x + 3)$



To find y-intercepts, make x=0 and solve for y.

To find x-intercepts, make y=0 and solve for x.

$y=(-1-1)(-1+3)$

$y=(-2)(2)$

$y=(-4)$

Line of Symmetry $x=-1$

Vertex $(-1,-4)$

x-intercepts $(1,0)$ $(-3,0)$

y-intercept $(0,-3)$

x-intercepts:

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

$x-1=0$ and $x+3=0$

$+1\ +1$ $-3\ -3$

$x=1$ $x=-3$

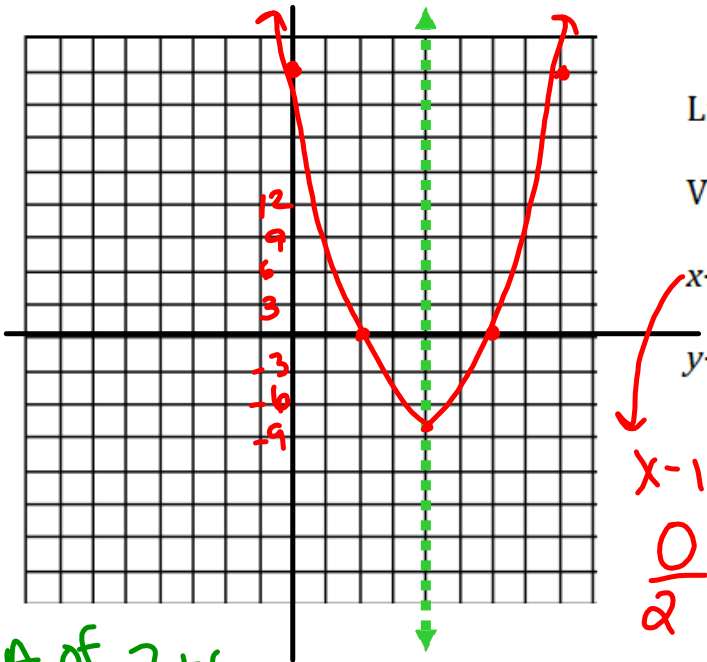
y-intercepts:

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

$y=(-1)(3)$

$y=-3$

2. $f(x) = 2(x-2)(x-6)$



Line of Symmetry $x=4$

Vertex _____

x-intercepts (2,0) (6,0)

y-intercept (0,24)

3 & 4 on p46-47

AoS: $\frac{2+6}{2} = \frac{8}{2} = 4$

x-int:

$\frac{0}{2} = \frac{2(x-2)(x-6)}{2}$

$0 = (x-2)(x-6)$

$x-2=0$ and $x-6=0$

$+2 \quad +2 \qquad +6 \quad +6$

$x=2 \qquad x=6$

y-int:

$f(0) = 2(0-2)(0-6)$

$f(0) = 2(-2)(-6)$

$f(0) = 24$

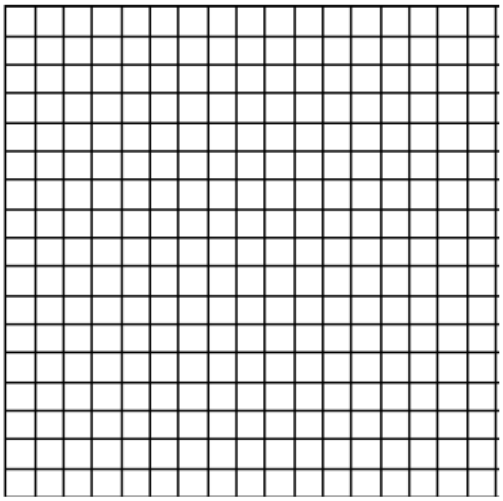
Vertex (4,-8)

$f(4) = 2(4-2)(4-6)$

$f(4) = 2(2)(-2)$

$f(4) = -8$

3. $g(x) = -x(x + 4)$



Line of Symmetry _____

Vertex _____

x-intercepts _____ _____

y-intercept _____

4. Based on these examples, how can you use a quadratic function in factored form to:
   a. Find the line of symmetry of the parabola?

   b. Find the vertex of the parabola?

   c. Find the x-intercepts of the parabola?

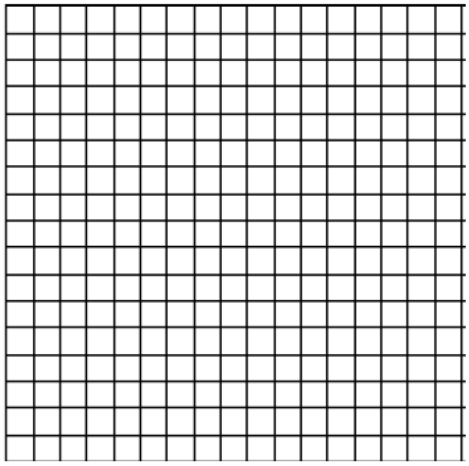
   d. Find the y-intercept of the parabola?

   e. Find the vertical stretch?

5. Choose any two **linear** functions and write them in the form: $f(x) = m(x - c)$, where m is the slope of the line. Graph the two functions.

Linear function 1:

Linear function 2:

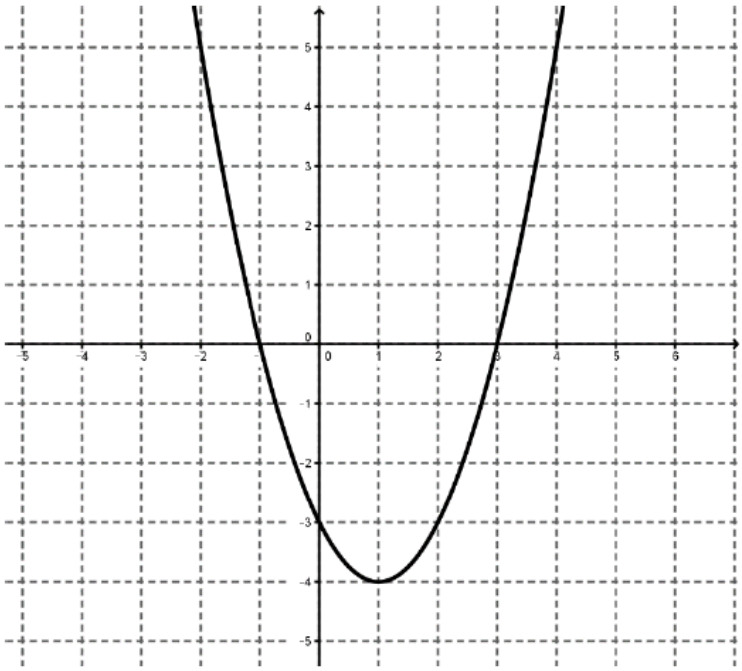


6. On the same graph as #5, graph the function *P(x)* that is the product of the two linear functions that you have chosen. What shape is created?

7. Describe the relationship between *x*-intercepts of the linear functions and the *x*-intercepts of the function *P(x)*. Why does this relationship exist?

8. Describe the relationship between y-intercepts of the linear functions and the y-intercepts of the function $P(x)$. Why does this relationship exist?

9. Given the parabola to the right, sketch two lines that could represent its linear factors.



10. Write an equation for each of these two lines.

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11. How did you use the x and y intercepts of the parabola to select the two lines?

12. Are these the only two lines that could represent the linear factors of the parabola? If so, explain why. If not, describe the other possible lines.

13. Use your two lines to write the equation of the parabola. Is this the only possible equation of the parabola?

Homework

Finish 2.8 "Ready, Set, Go"

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