

3.3 Quadratic Functions Day 2 Notes and Homework

In this section, you will learn how to convert each quadratic function into the various forms.

How do you go from X-Intercept Form (IF) or Transformation Form (TF) to Polynomial Form:

IF \rightarrow PF

A. $f(x) = -2(x-4)(x+2)$
 $f(x) = -2(x^2 - 2x - 8)$
 $f(x) = -2x^2 + 4x + 16$
 set $x=0$

TF \rightarrow PF

B. $f(x) = 3(x-2)^2 - 47$
 $3(x^2 - 4x + 4) - 47$
 $3x^2 - 12x + 12 - 47$
 $f(x) = 3x^2 - 12x - 35$

1. $f(x) = 3(x-2)(x+1)$

2. $f(x) = -2(x-5)(x-2)$

3. $f(x) = -2(x+3)^2 - 4$

How do you go from Polynomial Form (PF) to Transformation Form (TF): PF \rightarrow TF

2 Ways:

$$y = a(x-h)^2 + k$$

(4, -20)

A. Find the Vertex

$f(x) = 2x^2 - 16x + 12$

$$x = \frac{-b}{2a} = \frac{16}{2(2)} = 4$$

$$y = 2(4)^2 - 16(4) + 12 = -20$$

$$y = 2(x-4)^2 - 20$$

B. Complete the square

$f(x) = 2x^2 - 12x + 14$

$$f(x) = 2x^2 - 12x + 14$$

$$= 2(x^2 - 6x + 9) + 14 - 18$$

$$f(x) = 2(x-3)^2 - 4$$

4. $f(x) = 3x^2 - 12x + 10$

5. $f(x) = -6x^2 - 12x - 1$

6. $f(x) = x^2 - 6x - 3$

How to convert from Polynomial Form (PF) to X Intercept Form (IF): $PF \rightarrow IF$ quad comp.

A. $f(x) = x^2 + 4x - 5$
 $f(x) = (x+5)(x-1)$

B. $f(x) = 3x^2 - 14x - 5$
 $= (3x+1)(x-5)$
 $x = -1/3 \quad x = 5$
 $f(x) = 3(x + \frac{1}{3})(x-5)$

C. $f(x) = x^2 - 8x - 3$
 $x^2 - 8x - 3 = 0$
 $x^2 - 8x + 16 = 3 + 16$
 $\sqrt{(x-4)^2} = \sqrt{19}$
 $x = 4 \pm \sqrt{19}$
 $f(x) = (x - (4 + \sqrt{19}))(x - (4 - \sqrt{19}))$

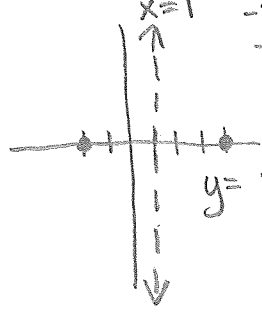
7. $f(x) = x^2 + 2x - 5$

8. $f(x) = x^2 - 4x + 6$

9. $f(x) = 2x^2 - x - 3$

How to go from X intercept form (IF) to Transformation Form (TF): $IF \rightarrow TF$

A. $f(x) = -2(x-4)(x+2)$
 $x=1 \quad -2(1-4)(1+2)$
 $-2(-3)(2) = 18$
 $(1, 18)$
 $y = -2(x-1)^2 + 18$



3 ways to do this one:

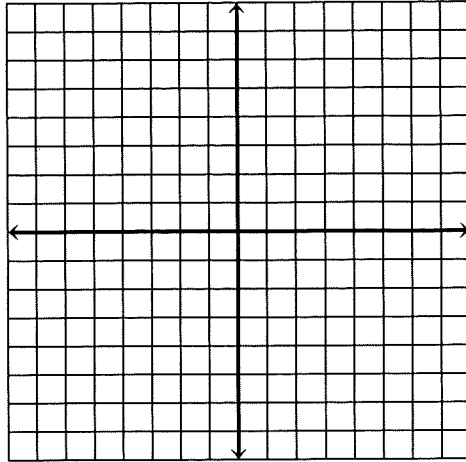
$-2(x^2 - 2x - 8)$
 $y = -2x^2 + 4x + 16$
 $x = \frac{-b}{2a} = \frac{-4}{-4} = 1$
 $y = 18$
 $y = -2(x-1)^2 + 18$

$y = -2x^2 + 4x + 16$
 $y = -2x^2 + 4x + 16$
 $-2(x^2 - 2x + 1) + 16 + 2$
 $y = -2(x-1)^2 + 18$

10. $f(x) = 3(x+1)(x-5)$

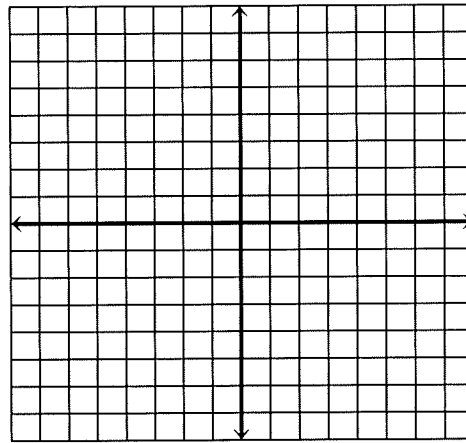
11. $f(x) = -4(x-6)(x+2)$

12. $f(x) = -6(x-2)^2 - 5$



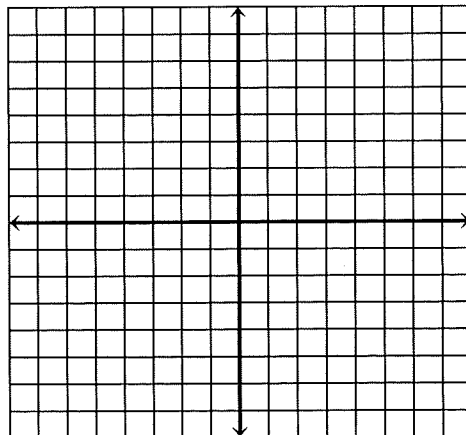
- a. _____
 Polynomial form
- _____
- X intercept form
- b. up or down: _____
- c. axis of symmetry : _____
- d.x-int: _____
- y-int: _____

13. $f(x) = 4(x-2)(x+1)$



- a. _____
 Polynomial form
- _____
- Transformation form
- b. up or down: _____
- c. axis of symmetry : _____
- d.x-int: _____
- y-int: _____

14. $f(x) = 3x^2 + 24x + 45$



- a. _____
 X intercept form
- _____
- Transformation form
- b. up or down: _____
- c. axis of symmetry : _____
- d.x-int: _____
- y-int: _____

