Unit 2A: Quadratic Transformations & Factoring

1a) How do you know if an equation will graph as a parabola?

We need to have an x^2 term in the equation & no higher exponent

1b) Cirlce all equations below that will graph as a parabola.

$y = (x + 4)(2x - 1)$

$y = 6x + 8$

$y = x^4 - x^2$

$y = x^2 - 3x$

2. Rewrite the following quadratic in Standard Form:

Multiply $y = (x - 6)(2x + 3)$

$2x^2 + 3x - 12x - 18$

$$y = 2x^2 - 9x - 18$$

3. Multiply: $(3x - 4)^2$

$(3x-4)(3x-4)$

$9x^2 - 12x - 12x + 16$

$9x^2 - 24x + 16$

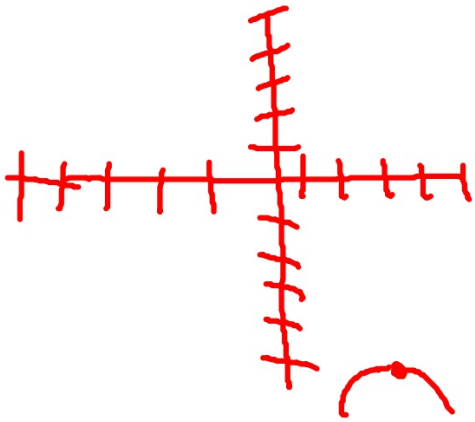
4. Identify the vertex of the function: $y = 2(x + 1)^2 + 9$

$(-1, 9)$

5. Identify the roots of the function: $y = (x - 8)(x + 2)$

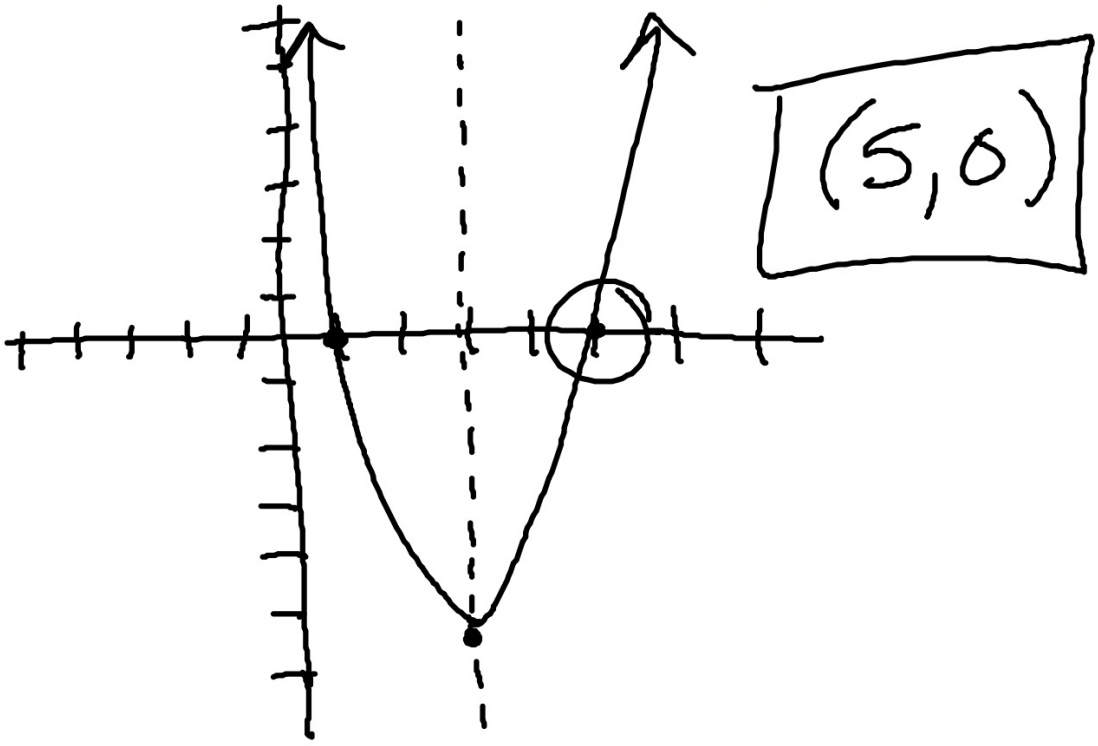
$(8, 0)$ $(-2, 0)$

6. If a parabola opens down and has a vertex of (3, -5), how many roots will it have?

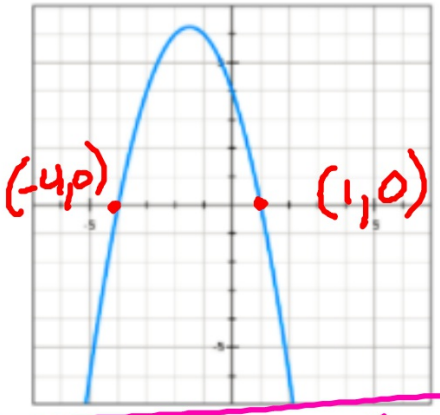


0 roots

7. A parabola is known to have 2 roots and a vertex at (3, -5). If one x-intercept is at (1, 0), what are the coordinates of the other x-intercept?



8. Write 3 equations for the given parabola:



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

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

x^2+3x-4

$y=(x+1.5)^2-6.25$

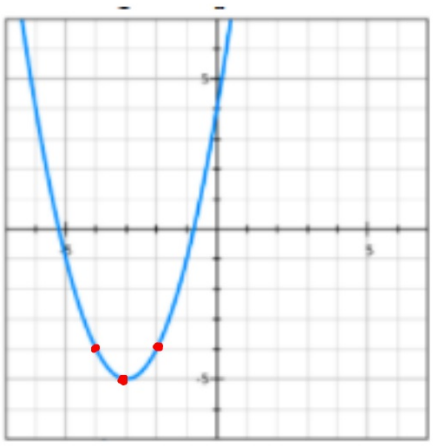
$(1.5)^2=2.25$

Vertex Form: $y=(x+1.5)^2-6.25$

Factored Form: $y=(x-1)(x+4)$

Standard Form: $y=x^2+3x-4$

9. Write 3 equations for the given parabola:



$(x+3)(x+3)-5$

$x^2+9+3x+3x-5$

x^2+6x+4

Vertex Form: $y=(x+3)^2-5$

Factored Form: _____

Standard Form: $y=x^2+6x+4$

10. Factor: $x^2 - 9x - 36$

$(x-12)(x+3)$

11. $3x^2 + 15x + 12$

36

$12x + 3x = 15x$

$y = (x+4)(3x+3)$

	x	4
3x	$3x^2$	12x
3	3x	12

12. $4x^2 + 6x - 18$

13. $9x^2 - 25$

14. List all the transformations: $y = -2(x + 5)^2 - 7$

Reflect over x-axis

Vertical Stretch by 2

Translate left 5

Translate down 7

15. Given the following transformations, graph the quadratic:

- Reflected over the x-axis — facing down
- Translated left 3 and up 4 — vertex (−3, 4)
- Vertical stretch by 2 — multiplies by 2