

1. Consider the function $f(x) = 2x^2 - 8x + 4$

a. What type of graph will this be? How do you know?

Parabola b/c of the x^2

b. Will the graph open up or down? Justify.

up $a = 2 > 0$

c. Find the equation of the axis of symmetry.

$$X = \frac{-b}{2a} = \frac{-(-8)}{2(2)} = \frac{8}{4} = 2 \quad X = 2$$

d. Find the vertex.

$$2(2)^2 - 8(2) + 4 \quad (2, -4)$$

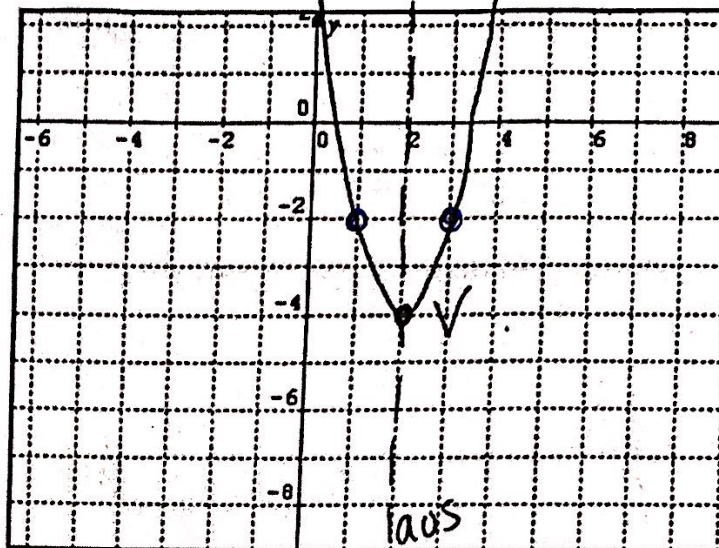
$$2(4) - 16 + 4$$

$$8 - 16 + 4$$

$$-8 + 4 \quad (0, 4)$$

$$-4$$

e. Find the y-intercept.



f. Does the graph have a maximum or minimum value? What is the value?

min @ -4

2. Consider the function $f(x) = -\frac{1}{2}(x - 1)^2 + 3$

a. State the transformations.

ROX, comp (1/2), Right 1, up 3

b. Find the vertex.

(1, 3)

c. Does the parabola open up or down? Justify. down $a = -1/2 < 0$

d. State the domain and range of the function in interval notation.

~~D: (-∞, ∞)~~ ~~R: (-∞, 3]~~

D: \mathbb{R} R: $y \leq 3$

3. Write a quadratic equation in standard form given the roots: -3, 2

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

$$x^2 - 7x + 3x - 6$$

$$y = x^2 + x - 6$$

Factor the following completely.

4. $x^2 - x - 12 =$

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

7. $16z^3 - z =$

$z(16z^2 - 1) = z(4z-1)(4z+1)$

5. $x^2 + 18xy + 81y^2 =$

$(x+9y)(x+9y)$

8. $6y^2 + 17y + 10 =$

$y^2 + 17y + 60 = (y+2)(y+15)$

6. $9x^3 + 36x^2 - 4x - 16 =$

$9x^2(x+4) - 4(x+4)$

$(9x^2 - 4)(x+4) = (3x-2)(3x+2)(x+4)$

Solve the following by factoring and zero product property. Box all answers.

10. $y^2 - 49 = 0$

$(y-7)(y+7) = 0$

$y = 7, -7$

13. $4x^3 + 10x^2 - 24x = 0$

$x(2x^2 + 5x - 12) = 0$

$(x^2 + 5x - 24) = 0$

16. $2t^4 + 16t = 0$

$2x(x + \frac{8}{2})(x - \frac{3}{2})$

$2x(x+4)(x-3)$

$x = 0, -4, 3/2$

$2t(t^3 + 8) = 0$

$2t(t+2)(t^2 - 2t + 4)$

$t = 0, t = -2$

11. $y^2 - 12y + 36 = 0$

$(y-6)(y-6) = 0$

$y = 6$

14. $25z^2 - 144 = 0$

$(5z-12)(5z+12)$

$z = 12/5, -12/5$

12. $x^2 - 16x - 36 = 0$

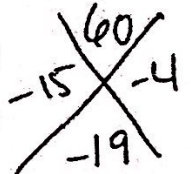
$(x-18)(x+2) = 0$

$x = 18, x = -2$

15. $12y^2 - 19y + 5 = 0$

$y^2 - 19y + 60 = 0$

$(y - \frac{15}{12})(y - \frac{4}{12}) = 0$



$(y - \frac{5}{4})(y - \frac{1}{3}) = 0$

$(4y - 5)(3y - 1) = 0$

$y = 5/4, y = 1/3$