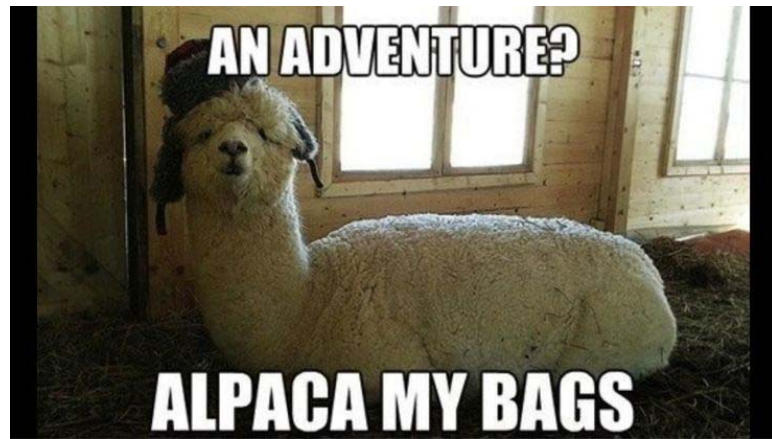


Monday, September 12, 2016

- New Seats
- New Calendar
- 2.1 Notes - Polynomials, Quadratics
- Practice: Player/Coach



2.1 Polynomials + Quadratics

polynomial : function w/ all variables having positive, whole number powers

- ① $f(x) = 4x^2 - 3x^4 + x - 10$ Yes, Polynomial Degree: 4 leading Coefficient: -3
- ② $f(x) = \sqrt{2x-1}$ No - square root is $\frac{1}{2}$ power
- ③ $f(x) = 3x^3 - \sqrt{2}x^4 + 2x$ - Yes Degree: 4 L.C. $-\sqrt{2}$
- ④ $f(x) = \frac{1}{x^2} + 2x^2 + 100$ - No - negative exponent
- ⑤ $f(x) = x^3 - x^2 + x + 1$ - Yes : Deg: 3 L.C. 1

Quadratics / Parabolas

Standard Form

$$f(x) = ax^2 + bx + c$$

deg = 2

L.C. = a

Vertex: $h = \frac{-b}{2a}$

$k = c - ah^2$
(or plug into equation)

Vertex Form

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

Vertex: (h, k)

axis of symmetry $x = h$

L.C. = a

① $f(x) = -2(x+3)^2 + 1$

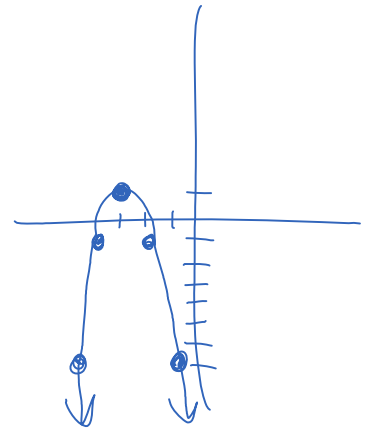
(A) Vertex, Axis of Symmetry

(A) Vertex, Axis of Symmetry
 $(-3, 1)$ $x = -3$

(B) Transformations + Graph

Hor
Left 3

Vert
Reflect over x-axis
Stretch BAFO 2



(C) Standard Form

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

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

$$= -2(x^2 + 6x + 9) + 1$$

$$= -2x^2 - 12x - 18 + 1$$

$$f(x) = -2x^2 - 12x - 17$$

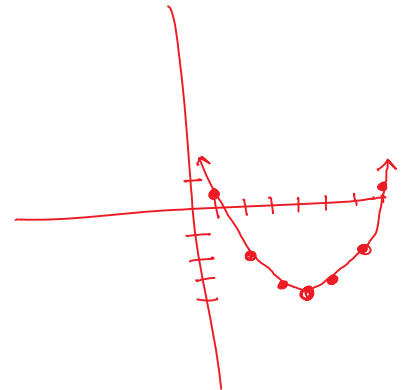
(2) $f(x) = \frac{1}{2}(x-4)^2 - 4$

(A) Vertex, Axis of Symmetry
 $(4, -4)$ $x = 4$

(B) Transformations, Graph

Hor
Right 4

Vert
Shrink BAFO $\frac{1}{2}$
Down 4



(C) Standard Form

$$f(x) = \frac{1}{2}(x^2 - 8x + 16) - 4$$

$$= \frac{1}{2}x^2 - 4x + 8 - 4$$

$$f(x) = \frac{1}{2}x^2 - 4x + 4$$

(3) $f(x) = -3x^2 + 6x - 5$ $a = -3$
 $b = 6$
 $c = -5$

(A) Vertex, Axis of Symmetry

$$h = \frac{-b}{2a} = \frac{-6}{2(-3)} = 1$$

$$k = c - ah = -5 - (-3)(1)^2 = -5 - (-3) = -2$$

Vertex $(1, -2)$
 axis of sym $x = 1$

(B) Vertex Form

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

$$y = -3(x-1)^2 - 2$$

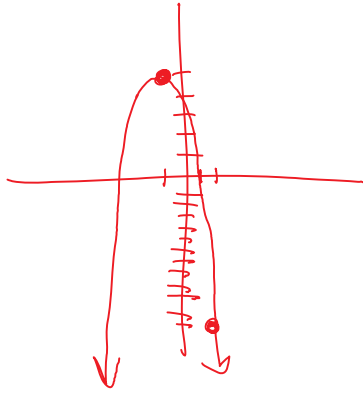
(ii) Vertex (-1.5) point on a parabola $(2, -13)$

④ Vertex $(-1, 5)$ point on a parabola $(2, -13)$
Write equation of quadratic.

[use vertex form]

$$(h, k) = (-1, 5)$$

$$(x, y) = (2, -13)$$



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

Solve for a

$$-13 = a(2+1)^2 + 5$$

$$-13 = a(9) + 5$$

$$-18 = a(9)$$

$$-2 = a$$

$$y = -2(x+1)^2 + 5$$