

In Exercises 1–6, determine which are polynomial functions. For those that are, state the degree and leading coefficient. For those that are not, explain why not.

1. $f(x) = 3x^{-5} + 17$ 2. $f(x) = -9 + 2x$

3. $f(x) = 2x^5 - \frac{1}{2}x + 9$ 4. $f(x) = 13$ $\times^0$

5. $h(x) = \sqrt[3]{27x^3 + 8x^6}$ 6. $h(x) = 4x - 5x^2$

P169 #1-6

~~$= 3x + 2x^2$~~

		degree	leading coeff.
1.	No neg. exp.	N.A	N.A
2.	Yes	1	2
3.	Yes	5	2
4.	Yes	0	13
5.	No		
6.	Yes	2	-5

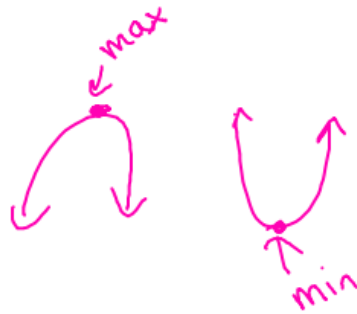
Quadratic

Quadratic Functions

- Standard form $ax^2 + bx + c$
- Vertex form $a(x - h)^2 + k$
- Any Quadratic function can be written in vertex form

Find the vertex of the following functions

- A) • $y = 2(x - 4)^2 + 7$
- B) • $y = 2(x + 4)^2 + 7$
- C) • $y = 2(x + 4)^2 - 7$
- D) • $y = 2(x - 4)^2 - 7$



vertex (h, k)

- A) $(4, 7)$
- B) $(-4, 7)$
- C) $(-4, -7)$
- D) $(4, -7)$

Converting to vertex form

Ex1 • $y = 2x^2 - 3x + 4$

$a=2 \quad b=-3 \quad c=4$

• $h = \frac{-b}{2a}$ ← opposite of b

- To find K plug in h for x in the standard form, k is the y

vertex $(\overset{x}{h}, \overset{y}{k})$

• $h = \frac{3}{2 \cdot 2} = \frac{3}{4}$

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

• $f\left(\frac{3}{4}\right) = 2\left(\frac{3}{4}\right)^2 - 3\left(\frac{3}{4}\right) + 4$

$= 2 \cdot \frac{9}{16} - \frac{9}{4} + 4$

$= \frac{9}{8} - \frac{9 \cdot 2}{4 \cdot 2} + \frac{4 \cdot 8}{1 \cdot 8}$

$= \frac{9}{8} - \frac{18}{8} + \frac{32}{8}$

$k = \frac{23}{8}$

Write the following function in vertex form

Ex 2 • $f(x) = 6x - 3x^2 - 5$

$-3x^2 + 6x - 5$
 $a = 3 \quad B = 6 \quad C = -5$

$H = \frac{-b}{2(a)}$

$H = \frac{-6}{2(-3)}$

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

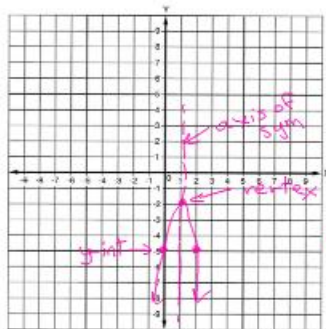
$y = -3(1)^2 + 6(1) - 5$
 $-3 + 6 - 5$

$\boxed{y = -2}$
 $K = -2$

To describe the graph of a Quadratic Function

- Vertex (h,K)
- Axis of the parabola (axis of symmetry) $x=h$
- Parabola opens upward ($a>0$) parabola opens downward ($a<0$)
- Initial value (y intercept) : $f(0)=c$
- X intercepts (quadratic formula)

$-3x^2 + 6x - 5$ y-int = -5 (0, -5)
 $-3(x-1)^2 - 2$ vertex (1, -2)
 $x=1$



$|a| = 3 > 1$
 v. stretch
 (+h in)
 No x-int