

Chapter 10. Final Exam Practice Questions.

Main Topic #1: Graphing parabolas

(1) What are the important parts of a parabola that you need to consider when graphing?

AXIS OF SYMMETRY

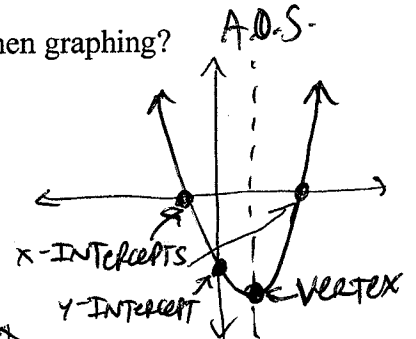
$$x = \frac{-b}{2a}$$

VERTEX

$$\left(\frac{-b}{2a}, \text{plug } \frac{-b}{2a} \text{ IN} \right)$$

X-INTERCEPTS

POINTS ON parabola THAT CROSS X-AXIS



Y-INTERCEPT (0, c)

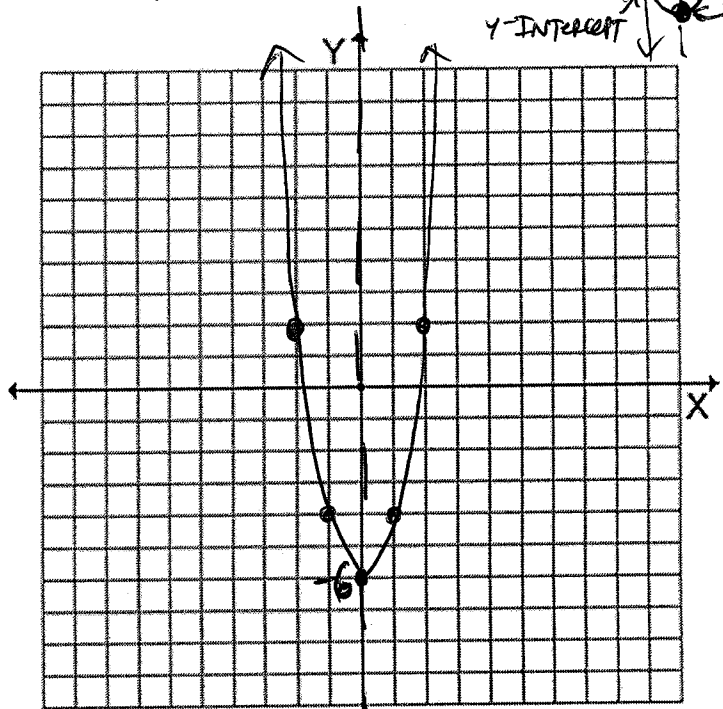
(2) Graph $y = 2x^2 - 6$

① opens up b/c $a > 0$

② A.O.S. $\rightarrow x = 0$ (b/c $b = 0$)

③ vertex $\rightarrow y = 2(0)^2 - 6 = -6$
 \downarrow
 (0, -6)

x	-2	-1	0	1	2
y	2	-4	-6	-4	2



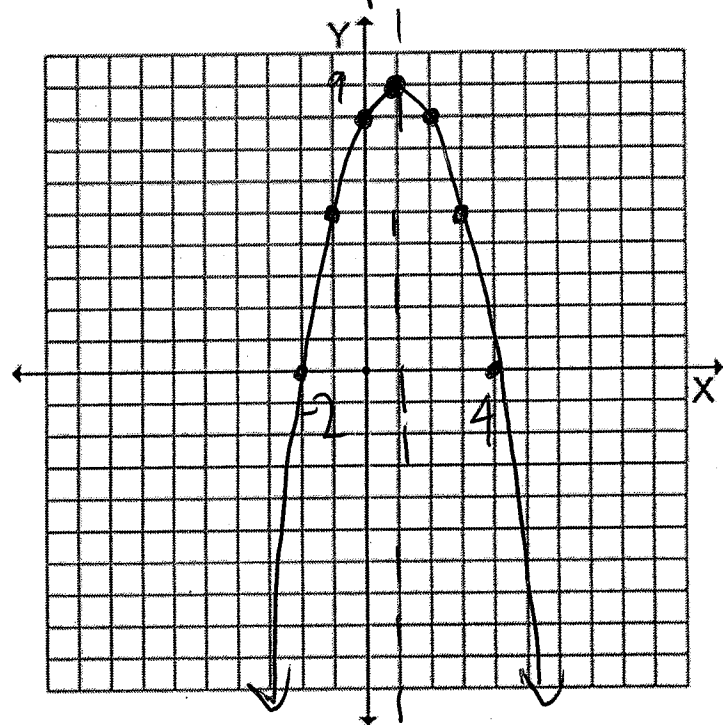
(3) Graph $y = -x^2 + 2x + 8$

① opens DOWN b/c $a < 0$

② A.O.S. $\rightarrow x = \frac{-2}{2(-1)} = 1$
 \downarrow
(x = 1)

③ vertex $\rightarrow y = -(1)^2 + 2(1) + 8$
 \downarrow
 (1, 9)
 $y = -1 + 2 + 8 = 9$

x	-1	0	1	2	3	4
y	5	8	9	8	5	0



Main topic #2: Solve quadratic equations

(4) What are your options for solving quadratic equations? When should you use each method?

1. FACTORING → EASILY FACTORABLE
2. QUADRATIC FORMULA → ANYTIME!
3. COMPLETING THE SQUARE → $a=1$ and b is even
4. SQUARE ROOTS → $b=0$

(5) Solve: $3x^2 - 300 = 0$

$$3x^2 = 300$$

$$x^2 = 100$$

$$x = \pm 10$$

(6) Solve: $2x^2 - 10x = 48$

$$2x^2 - 10x - 48 = 0$$

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

$$2(x - 8)(x + 3) = 0$$

$$x = 8, -3$$

(7) Solve: $x(x - 2) = 4$

$$x^2 - 2x - 4 = 0$$

$$x = 1 \pm \sqrt{5}$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(-4)}}{2(1)} = \frac{2 \pm \sqrt{20}}{2} = \frac{2 \pm 2\sqrt{5}}{2} = 1 \pm \sqrt{5}$$

Main topic #3: Interpret the discriminant

(8) Where does the discriminant come from? How can it be used to help you understand quadratic equations?

- $b^2 - 4ac$ is the radicand from the QUADRATIC FORMULA

- IT WILL TELL YOU HOW MANY SOLUTIONS / X-INTERCEPTS a QUAD. EQ. HAS

(9) Tell whether the equation $-3x^2 - 6 = -4x$ has two solutions, one solution, or no solution.

$$-3x^2 + 4x - 6 = 0$$

$$(4)^2 - 4(-3)(-6) = 16 - 72 = -56$$

NEGATIVE, SO NO REAL SOLUTIONS

(10) Find the number of x-intercepts of the graph of $y = x^2 - 2x + 1$.

$$(-2)^2 - 4(1)(1)$$

$$4 - 4 = 0$$

ZERO, SO ONE X-INTERCEPT