Find the vertex and zeros & intervals inc/dec

$$y = -2x^2 + 4x + 7$$

- Used to identify the "type" of solutions you will have (without having to solve)

$$b^2 - 4ac$$ Discriminant

*** *note that there is no radical over the number*

If the discriminant is…

- A perfect square---2 rational solutions

- A non perfect sq—2 irrational sol.

- Zero—1 rational sol.

- Negative—2 complex sol.

Identify the nature of the solution

$$ex. \; -5x^2 + 8x - 1 = 0$$

$$ex. \; -7x + 15x^2 - 4 = 0$$

Quadratic Formula

Solve for the zeros

$$ax^2 + bx + c = 0$$

- Standard form
- equal 0
- Identify a, b, c

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve using quadratic Formula

$$x^2 + 5x - 14 = 0$$

$a = 1 \quad b = 5 \quad c = -14$

$$x = \frac{-5 \pm \sqrt{5^2 - 4(1)(-14)}}{2(1)}$$

$$x = \frac{-5 \pm \sqrt{25 + 56}}{2}$$

$$x = \frac{-5 \pm \sqrt{81}}{2}$$

$$x = \frac{-5 \pm 9}{2}$$

$$x = \frac{-5 + 9}{2} \qquad x = \frac{-5 - 9}{2}$$

$$\boxed{x = 2 \quad x = -7}$$

① Standard form

② Identify a, b, c

③ Plug into Quadr. formula

④ Simplify beginning w/ the radical

Solve using quadratic Formula

$$4x^2 = 8 - 3x$$

$$4x^2 + 3x - 8 = 0$$

$$a = 4 \quad b = 3 \quad c = -8$$

$$x = \frac{-3 \pm \sqrt{9 - 4(4)(-8)}}{2(4)}$$

$$x = \frac{-3 \pm \sqrt{137}}{8}$$

Solve using quadratic Formula

$$y = 9 - 3x^2$$

$$y = -3x^2 + 9$$

$$a = -3 \quad b = 0 \quad c = 9$$

$$x = \frac{-0 \pm \sqrt{0^2 - 4(-3)(9)}}{2(-3)}$$

$$x = \frac{\pm\sqrt{108}}{-6} \qquad 36 \cdot 3$$

$$x = \frac{\pm 6\sqrt{3}}{-6} \qquad \frac{6\sqrt{3}}{-6} \qquad \frac{-6\sqrt{3}}{-6}$$

$$x = \pm\sqrt{3} \qquad -\sqrt{3} \qquad \sqrt{3}$$

Solve using quadratic Formula

$$y = 7x^2 + 6x - 5$$

$$a = 7 \quad b = 6 \quad c = -5$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(7)(-5)}}{2(7)}$$

$$x = \frac{-6 \pm \sqrt{176}}{14} \qquad x = \frac{-6 \pm 4\sqrt{11}}{14}$$

$$x = \frac{-3 \pm 2\sqrt{11}}{7}$$

Solve using quadratic Formula

$$f(x) = 10 - 5x^2 - 15x$$

Solve using quadratic Formula

$$2x^2 = 3x - 1$$

Solve using quadratic Formula
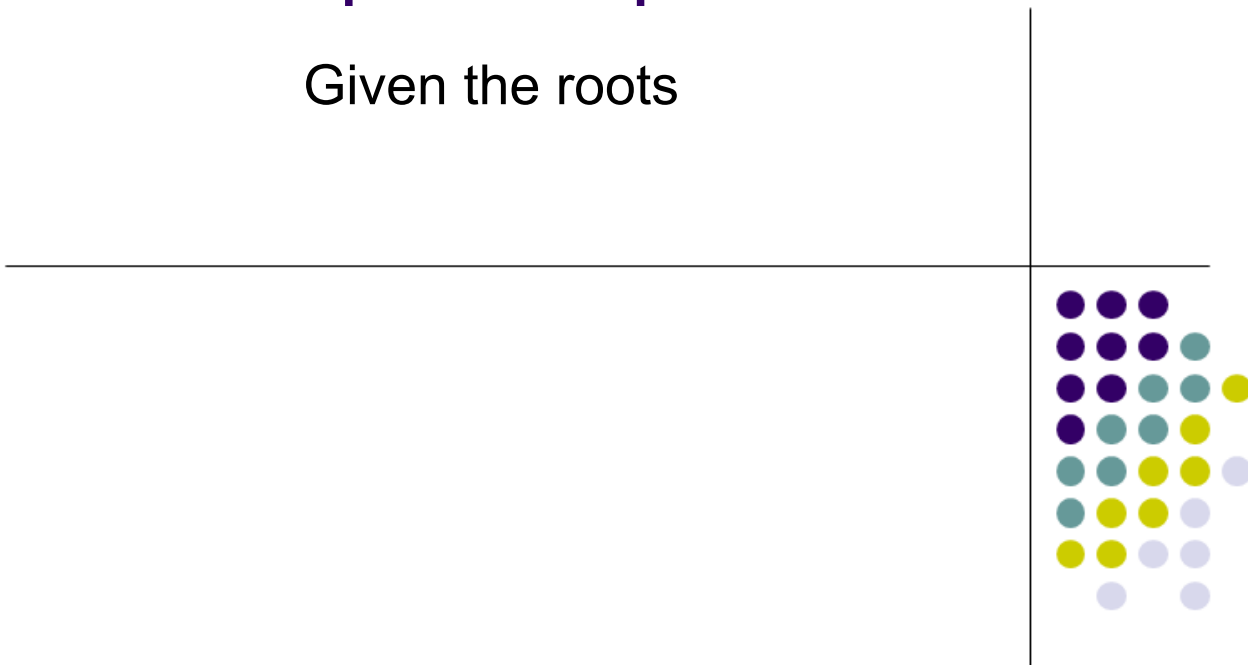
$$y = -2x^2 + 3x - 1$$

$$f(x) = -x^2 + 6x + 2$$

$$\frac{-2 \pm \sqrt{-4}}{3} = \frac{-2 \pm 2i}{3}$$

$$2x + x^2 = 2$$

Find the quadratic equation

Given the roots

Given: roots are 3 and 2

Find: the quadratic equation with lead coefficient of 1

Given: roots are -4 and 6

Find: the quadratic equation with lead coefficient of 1

Given: roots are -5 and -2

Find: the quadratic equation with lead coefficient of 1

Given: roots are 3 and 2

Find: the quadratic equation that contains the point (4, 8)

Given: roots are 6 and -2

Find: the quadratic equation that contains the point (2, -3)

Given: roots are 1 and -3

Find: the quadratic equation that contains the point (5, -2)

Find: the quadratic equation that contains the point (3, -2)

Given: roots are 3/4 and -2/5

Find: the quadratic equation that contains the point (1, -5)

Homework

- Worksheet