

- REEF polling will start to count on Wed.
- Same for web homework.
- Check your student ID # in REEF. It should not start w/ a 9.

Works heads.
- Bring to class.

MA110 9am

8/29/16

What is an
x-intercept?

A point on the
graph w/ $y=0$

x-intercepts for

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

- Set $y=0$

$$x^2 + 4 \cdot 0^2 = 4$$

$$x^2 = 4$$

$$x = +2 \text{ or } -2.$$

Ans.

Complete the square.

Solve

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

Step 1 divide by a

$$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$$

$$\begin{array}{cc} -c/a & -c/a \end{array}$$

$$x^2 + \frac{b}{a}x + \frac{b^2}{4a^2} = -\frac{c}{a} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = -\frac{c}{a} + \frac{b^2}{4a^2}$$

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

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

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

The discriminant.

$$b^2 - 4ac$$

$$b^2 - 4ac < 0$$

No real roots.

$$b^2 - 4ac = 0$$

One double root.

$$b^2 - 4ac > 0$$

2 real roots.

4

$$\text{Solve } x - \frac{1}{x+1} = 1.$$

Solve

$$x^4 + 3x^2 = 4.$$

$$(x+1)\left(x - \frac{1}{x+1}\right) = (x+1)$$

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

$$x^2 = 2$$

$$x = \pm \sqrt{2}$$

Check -

- Multiply by $x+1$. ~~Can~~ Can introduce extra roots, if $x+1=0$

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

$$(\textcircled{x^2})^2 + 3x^2 - 4 = 0$$

u

$$u^2 + 3u - 4 = 0$$

$$(u+4)(u-1) = 0$$

Back to

$$(x^2+4)(x^2-1) = 0$$

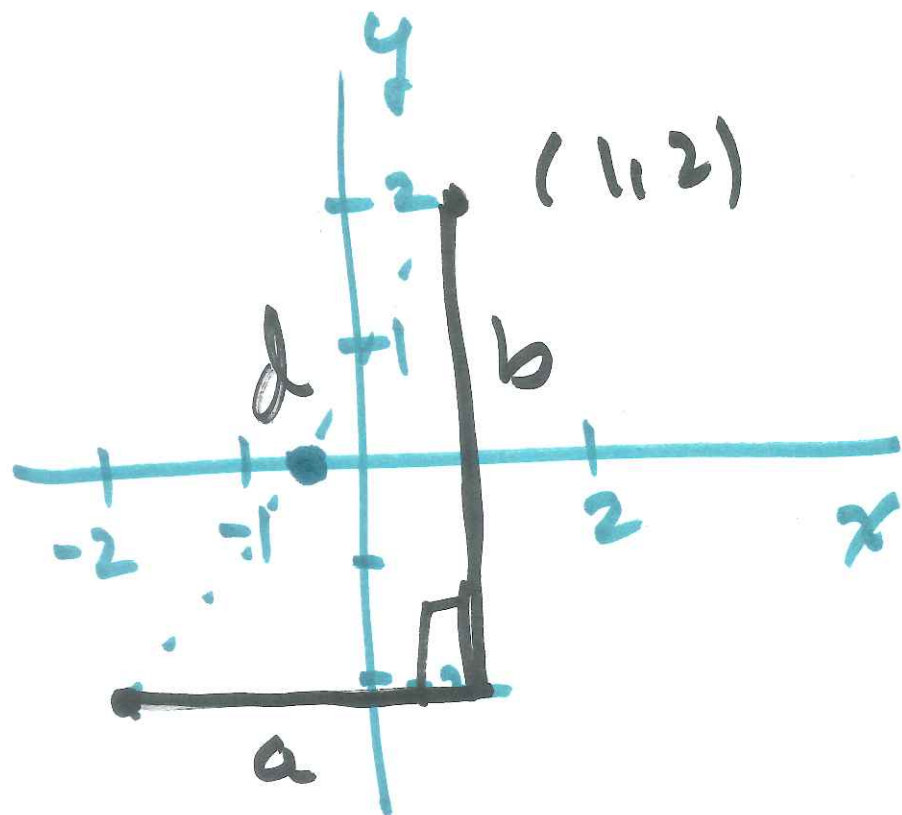
$$x^2 = -4 \text{ or } x^2 = 1.$$



$$x = +1 \text{ or } -1$$

Check.

Coordinates.



Points $(1, 2) = (x_1, y_1)$

$(-2, -2) = (x_2, y_2)$

Midpoint.

$$\frac{1 + -2}{2}, \frac{2 + -2}{2}$$

$$\left(-\frac{1}{2}, 0\right)$$

Distance formula.

Pythagorean Theorem

$$d^2 = a^2 + b^2$$

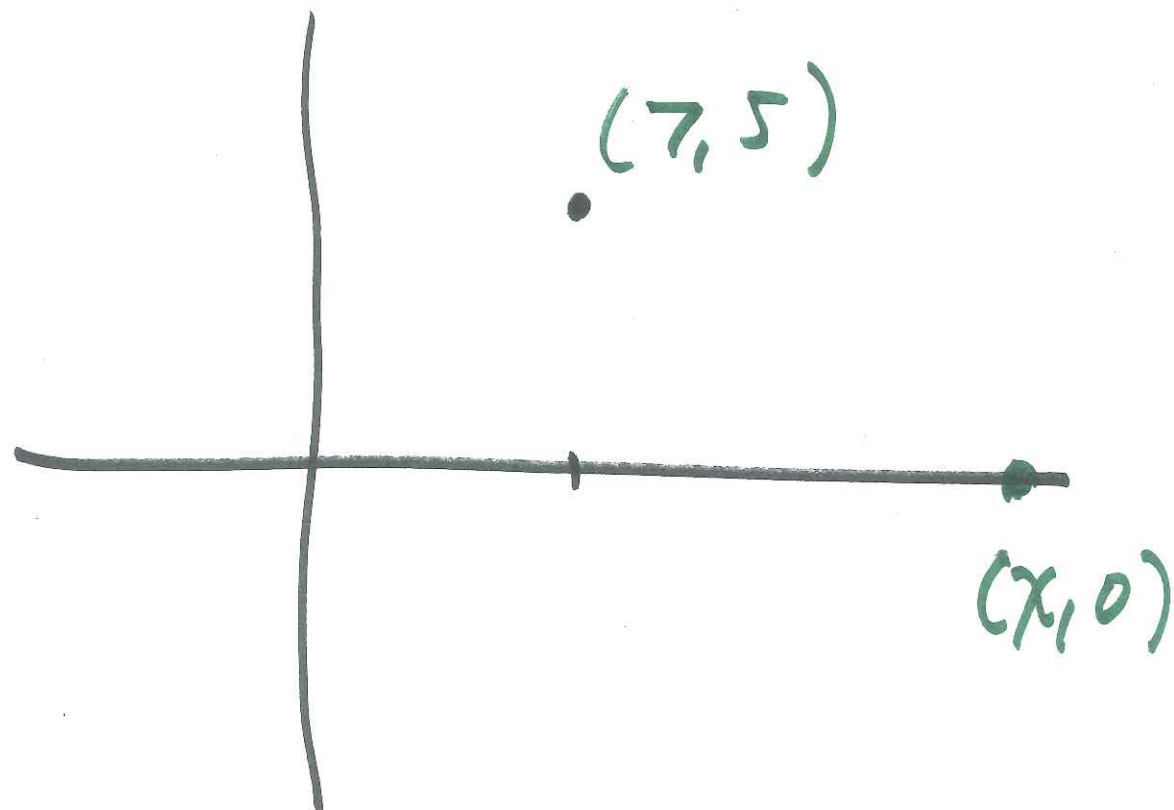
$$= (1 - -2)^2 + (2 - -2)^2$$

$$= 3^2 + 4^2$$

$$d^2 = 25$$

$$d = \sqrt{25}$$

$$= 5.$$



Find the points
on the x-axis
that are distance
13 from $(7, 5)$.

$$\text{dist} = \sqrt{(x-7)^2 + (5-0)^2}$$
$$= 13$$

$$(x-7)^2 + 25 = 169.$$

$$(x-7)^2 = 169 - 25$$
$$= 144$$

$$x-7 = \pm 12$$

$$x = 7 \pm 12.$$

$$= 19 \text{ or } -5.$$