

September 22, 2017

Circle

S.F.: $(x-h)^2 + (y-k)^2 = r^2$

- Center: (h, k)
- Radius: r

General: $x^2 + y^2 + ax + by + c = 0$

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Ways to solve quadratics

- To factor

$$x^2 - x - 12 = 0$$

$$(x-4)(x+3) = 0$$
- Use the Square Root Property
 - $x^2 + 9 = 0$

$$\sqrt{x^2} = \pm \sqrt{-9}$$

$$x = \pm 3i$$
 - $(x-2)^2 - 5 = 0$

$$\sqrt{(x-2)^2} = \pm \sqrt{5}$$

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

$$x = 2 \pm \sqrt{5}$$

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- Completing the Square
- Quadratic Formula

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

Can be used to solve any quadratic

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Uses of Completing the Square

- solve quadratics
- Convert equations of circles from general form to standard form.
- Convert quadratics from standard form to vertex form

$$(x-h)^2 + k = 0$$

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$\frac{ax^2 + bx + c}{a} = 0$; solve for x

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

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

$\frac{b}{a} \cdot \frac{1}{2} = \frac{b}{2a}$
 $(\frac{b}{2a})^2 = \frac{b^2}{4a^2}$ *add it to both sides*

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

Perfect Square Trinomial *Difference*

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

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

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

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

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

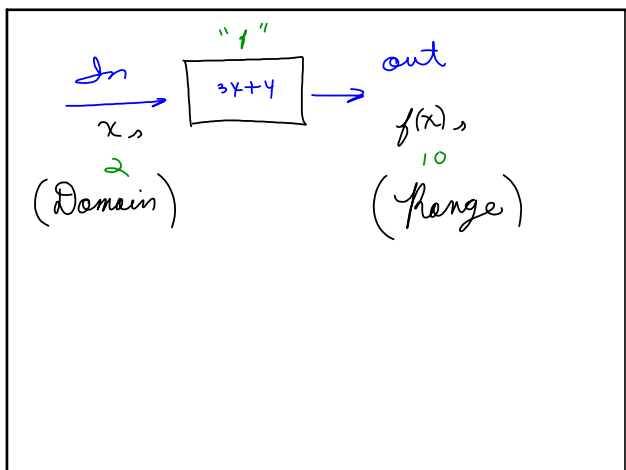
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Relation: an ordered pair

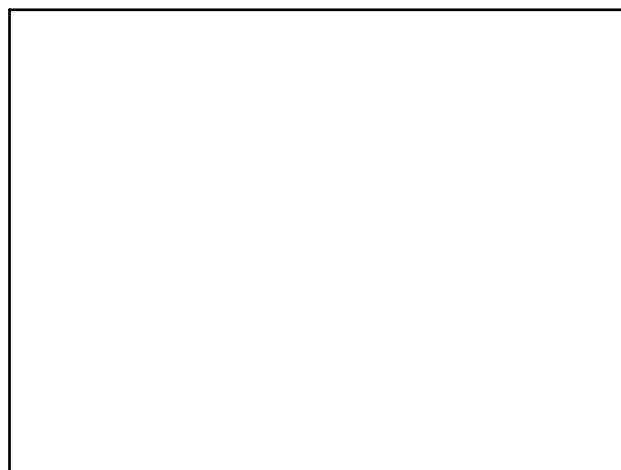
(x, y)
 (a, b)
 $(2, -5)$

A function, lets call it "f" maps an element from the set of first entries to one and only one entry to from the second set.

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