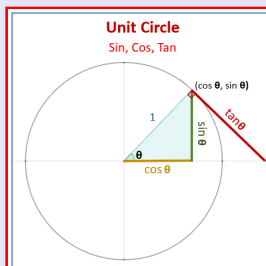


Trigonometry Lecture 3



Feb 19-8:47 AM

More algebra review:

Solve & graph

$$2x - 8 < 5x + 10$$

$$2x - 5x < 10 + 8$$

$$-3x < 18$$

Divide by -3

$$\frac{-3}{-3}x > \frac{18}{-3}$$

$$x > -6$$

Set-Builder notation

$$\{x \mid x > -6\}$$

Interval Notation

$$(-6, \infty)$$

Such that

Aug 28-10:27 AM

Solve by factoring

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

Soln Set

$$\left\{\frac{1}{2}, 2\right\}$$

$$(2x - 1)(x - 2) = 0$$

$$2x - 1 = 0$$

$$x = \frac{1}{2}$$

$$x - 2 = 0$$

$$x = 2$$

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Solve by Quadratic Formula → Quadratic Equation

$$3x^2 - 7x = 10$$

$$3x^2 - 7x - 10 = 0$$

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

$$= \frac{-(-7) \pm \sqrt{169}}{2(3)} = \frac{7 \pm 13}{6}$$

$$x = \frac{7+13}{6} = \frac{20}{6} = \frac{10}{3}$$

$$x = \frac{7-13}{6} = \frac{-6}{6} = -1$$

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

$$a=3, b=-7, c=-10$$

$$b^2 - 4ac$$

Discriminant

$$b^2 - 4ac = (-7)^2 - 4(3)(-10)$$

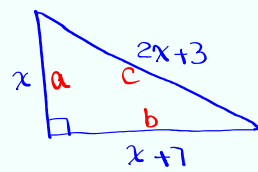
$$= 49 + 120 = 169$$

Soln Set

$$\left\{-1, \frac{10}{3}\right\}$$

Aug 28-10:37 AM

Find x Right Triangle
 Pythagorean Thm
 $a^2 + b^2 = c^2$



$$x^2 + (x+7)^2 = (2x+3)^2$$

$$x^2 + (x+7)(x+7) = (2x+3)(2x+3)$$

$$\underbrace{x^2 + x^2}_{+14x + 49} = 4x^2 + 12x + 9$$

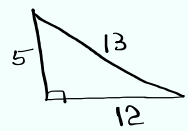
$$\underbrace{4x^2 + 12x + 9}_{-2x^2 - 14x - 49} = 0$$

$$2x^2 - 2x - 40 = 0 \quad \text{Divide by 2}$$

$$x^2 - x - 20 = 0$$

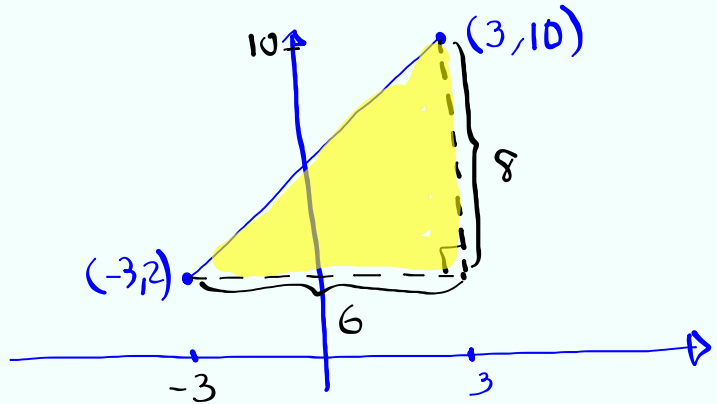
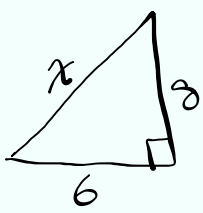
$$(x - 5)(x + 4) = 0$$

\downarrow $x = 5$ \downarrow ~~$x = -4$~~



Aug 28-10:45 AM

Find the distance from $A(-3, 2)$ to $B(3, 10)$.

$$6^2 + 8^2 = x^2 \rightarrow x^2 = 100 \quad x = \sqrt{100} \quad \boxed{x = 10}$$

Aug 28-10:57 AM

Distance between $A(x_1, y_1)$ & $B(x_2, y_2)$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$A(-3, 2)$$

$$B(3, 10)$$

$$d = \sqrt{(-3 - 3)^2 + (2 - 10)^2}$$

$$= \sqrt{(-6)^2 + (-8)^2} = \sqrt{36 + 64} = \sqrt{100}$$

$$= \boxed{10}$$

Aug 28-11:02 AM

Use the distance formula to find the distance between $(-2, 5)$ & $(4, -1)$.

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$= \sqrt{(-2 - 4)^2 + (5 - (-1))^2}$$

$$= \sqrt{(-6)^2 + (6)^2} = \sqrt{36 + 36} = \sqrt{72} \approx 8.5$$

$$= \sqrt{36 \cdot 2} = \sqrt{36} \sqrt{2} = \boxed{6\sqrt{2}}$$

Aug 28-11:04 AM

what is a circle?

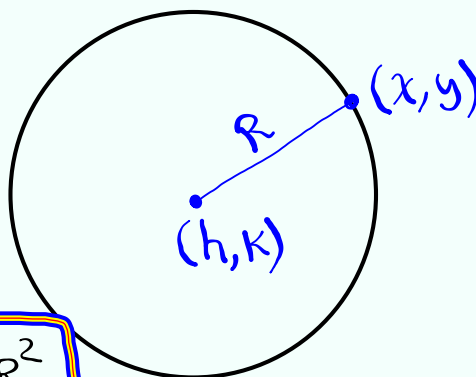
Set of all points that are same distance
from a fixed point.

Center

$$\sqrt{(x-h)^2 + (y-k)^2} = R$$

Square both sides

$$(x-h)^2 + (y-k)^2 = R^2$$



Aug 28-11:10 AM

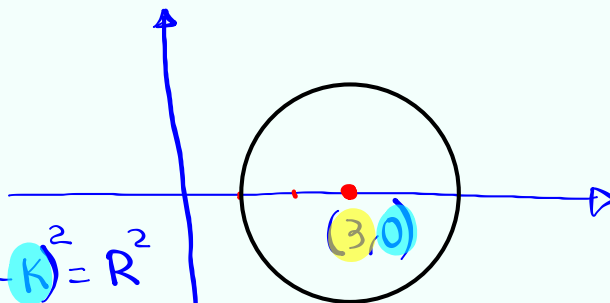
Draw a Circle centered at $(3, 0)$ with
radius 2.

find its eqn.

$$(x-h)^2 + (y-k)^2 = R^2$$

$$(x-3)^2 + (y-0)^2 = 2^2$$

$$(x-3)^2 + y^2 = 4$$

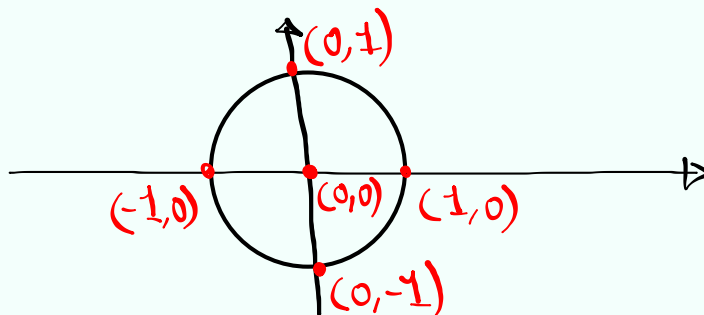


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Unit Circle

Centered at the origin

had a radius 1



Aug 28-11:19 AM

Draw a Circle centered at $(5, -4)$
with radius 3.

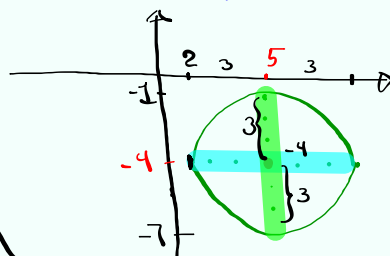
Find its equation

Find all intercepts.

None

Domain $2 \leq x \leq 8$

Range $-7 \leq y \leq -1$



$$(x - 5)^2 + (y - (-4))^2 = 3^2$$

$$(x - 5)^2 + (y + 4)^2 = 9$$

Aug 28-11:22 AM