What do these points have in common?

B(0,5)

E (-3,4)

5

4

A(5,0)

5

O(0,0)

3

4

3

$\overline{OC}$

D (-4,-3)

5

C(4,-3)

$$(\overline{OC})^2 = 4^2 + 3^2$$

$$(\overline{OC})^2 = 25$$

$$\overline{OC} = \pm 5$$

$$\overline{OC} = 5$$

Feb 28-11:38 AM

The Equation of a Circle in Standard Position   March 2/2016
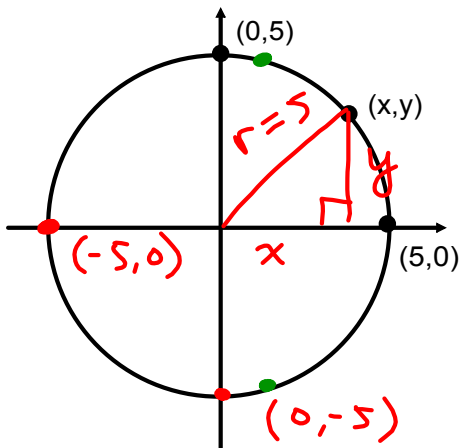
Circle: The set of all points that are equidistant
          from a reference point (the centre).

Standard Position: The centre of the circle is
                    at the origin (0, 0).

We can use this definition, along with the <u>distance
formula</u>, to determine the equation of a circle.

Feb 28-11:11 AM

Suppose we have a circle with a radius of 5, so every point on the circle is 5 units from the origin.

$$r^2 = x^2 + y^2$$

$$5^2 = x^2 + y^2$$

$$25 = x^2 + y^2$$

$$\boxed{x^2 + y^2 = 25}$$

equation of a circle with radius 5.

Feb 28-5:15 PM

In general, a circle has a radius, r, and the equation of a circle in standard position is:

$$x^2 + y^2 = r^2$$

Ex.1. Write the equation of a circle in standard position with:

(a) r = 2   (b) $r = 3\frac{1}{5}$

(a)
$$x^2 + y^2 = (2)^2$$
$$x^2 + y^2 = 4$$

(b)
$$r = 3 + \frac{1}{5}$$
$$r = \frac{15}{5} + \frac{1}{5}$$
$$r = \frac{16}{5}$$

$$\left(\frac{16}{5}\right)\left(\frac{16}{5}\right) =$$

$$x^2 + y^2 = \left(\frac{16}{5}\right)^2$$
$$x^2 + y^2 = \frac{256}{25}$$
$$25x^2 + 25y^2 = 256$$

Feb 28-5:15 PM

2

Ex.2 What is the radius of each circle?

(a) $x^2 + y^2 = 49$ (b) $x^2 + y^2 = 37$

$r^2 = 49$ $r^2 = 37$

$r = \pm\sqrt{49}$ $r = \sqrt{37}, \ r > 0$

$r = 7$

$(r \text{ is a distance})$

Assigned Work:

p.91-92 # 1, 2, 3a, 4, 5, 6, 8

Oct 3-9:00 PM

Assigned Work:

p.91-92 # 1, 2, 3a, 4, ⑤ 6, ⑧

5.

$x^2 + y^2 = r^2$

$(8)^2 + (15)^2 = r^2$

$r^2 = 64 + 225$

$r^2 = 289$
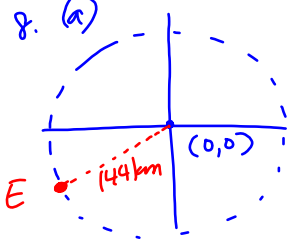
$r = 17, \ r > 0$

15 $P(8, 15)$ $x \ y$

r

$O(0, 0)$ 8
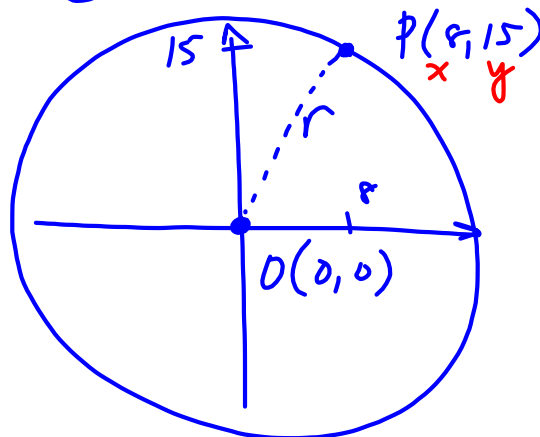
(b) $x^2 + y^2 = 289$

Feb 28-12:00 PM

8. (a)
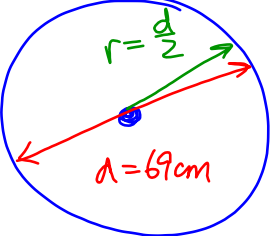
$x^2 + y^2 = r^2$

$x^2 + y^2 = 144^2$

$x^2 + y^2 = 20736$

$(0,0)$

E • --- 144km

$r = 144$

(c)

$r = \dfrac{d}{2}$

$d = 69cm$

$x^2 + y^2 = \left(\dfrac{69}{2}\right)^2$

$x^2 + y^2 = \dfrac{4761}{4}$

$x^2 + y^2 = 1190.25$

Mar 3-12:38 PM