Circles

Warm-Up Monday

https://goo.gl/7vwzzw

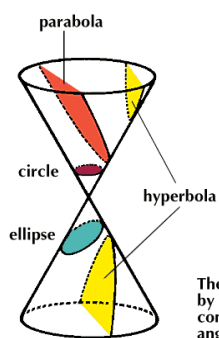(https://padlet.com/Korotkow/Prom2k17)

Go to the padlet and show me your prom pics!

If you didn't go to prom, tell me what you did this weekend :) (pics not required)

Circles

EQ: How do I write the equation of a circle in standard form?

parabola

circle

ellipse

hyperbola

The kind of conic section produced by the intersection of a plane and conical surface is determined by the angle at which the plane intersects the surface.
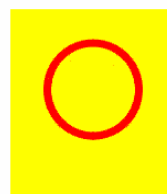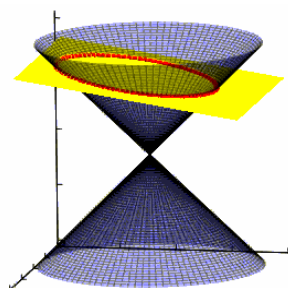
Ellipse

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http://www.math.odu.edu/cbii/calcanim

Circles

EQ: How do I write the equation of a circle in standard form?

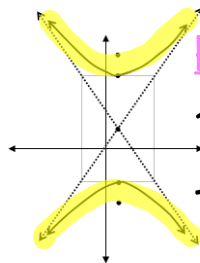*Parabola:* at an angle through base
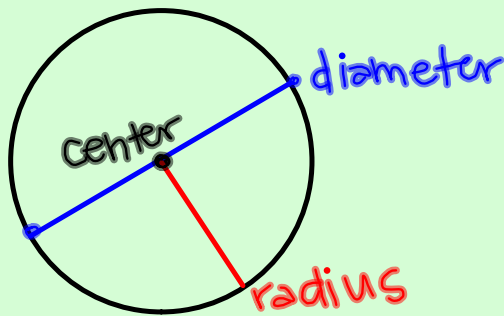
Circle: Parallel to base

Unit 11

Conics

Ellipse: at an angle, not through base

Hyperbola: Perpendicular to base

Circles

EQ: How do I write the equation of a circle in standard form?

diameter

center

radius

radius : r
center : (h, k)
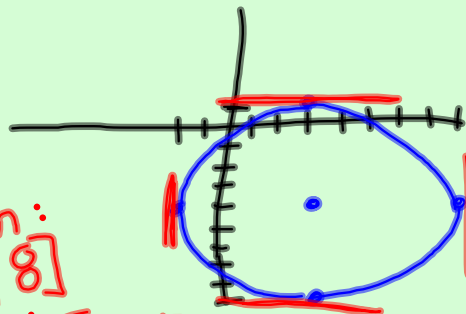
Standard Form

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

ex. Graph

$$(x - 3)^2 + (y + 4)^2 = 25$$

center $(3, -4)$
radius $\sqrt{25} = 5$

Domain: [-2, 8]
Range: [-9, 1]

Other Important Formulas

Area:
$$A = \pi r^2$$

Midpoint:
$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

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

Circles

EQ: How do I write the equation of a circle in standard form?

ex. Write the equation of the circle:
Center (6, -5) radius = 4
$$h \quad k$$
$$(x-6)^2 + (y+5)^2 = 4^2$$

ex. Write the equation of the circle:
Center (3, 2)   radius = 3√2
$$(3\sqrt{2})^2$$
$$3^2 (\sqrt{2})^2$$
$$9 \cdot 2$$
$$(x-3)^2 + (y-2)^2 = (3\sqrt{2})^2$$
$$\boxed{(x-3)^2 + (y-2)^2 = 18}$$

ex. Write the equation of the circle with center (1, 3) that
passes through (4,7)
$$h \quad k$$
$$(1,3) \quad (4,7)$$
$$x_1 \ y_1 \quad x_2 \ y_2$$
$$\boxed{(x-1)^2 + (y-3)^2 = 5^2}$$
$$d = \sqrt{(4-1)^2 + (7-3)^2}$$
$$= \sqrt{3^2+4^2} = \sqrt{9+16} = \sqrt{25}$$
OR
$$(4-1)^2 + (7-3)^2 = r^2$$

General Form $Ax^2 + Cy^2 + Dx + Ey + F = 0$
↳circle A = C

ex. $x^2 + y^2 - 10x + 12y + 45 = 0$
$$(x^2 - 10x + 25) + (y^2 + 12y + 36) = -45$$
$$\left(\tfrac{-10}{2}\right)^2 \qquad \left(\tfrac{12}{2}\right)^2 \qquad +25 \ +36$$
$$(x-5)^2 + (y+6)^2 = 16$$
center: $(5, -6)$
radius: 4
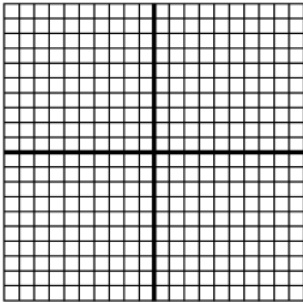
Complete the square TWICE

- Group the x's

- Group the y's

- Move the constant (other side)

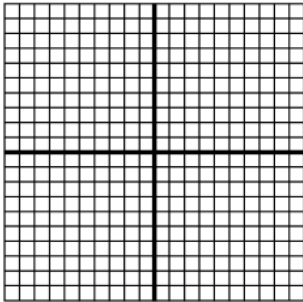**Practice – Circles – Day 1**

Name _____ Date _____ Period _____

Graph the following equations and state the domain and range:

1. $x^2 + (y-2)^2 = 9$

Center:

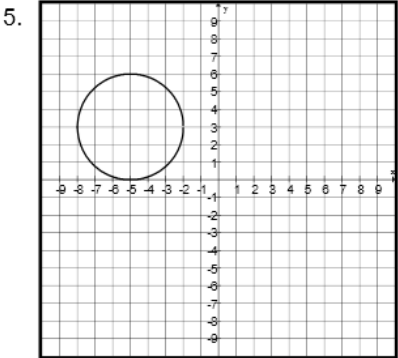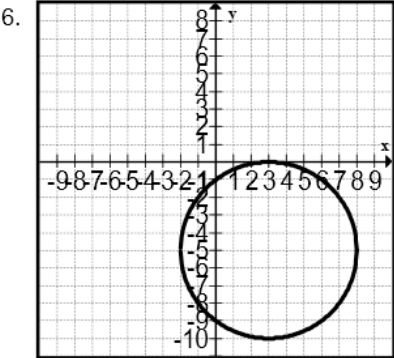Radius:

Domain:

Range:

2. $(x-1)^2 + (y+1)^2 = 4$

Center:

Radius:

Domain:

Range:

Write the equation of the circles then state their domain and range:
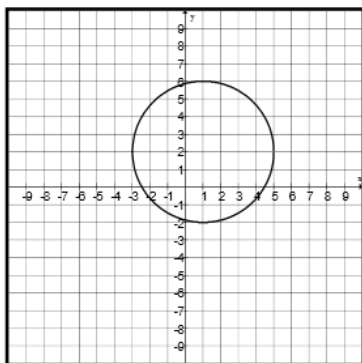
3. Center (-4, -5), Radius = $\sqrt{13}$

4. Center $\left(\dfrac{2}{3}, \dfrac{5}{8}\right)$ and an area of 49π.
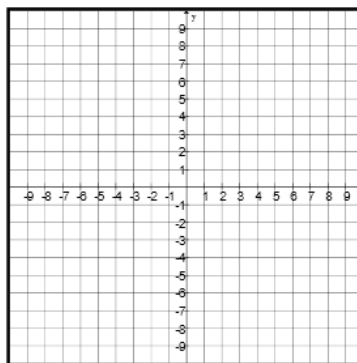
5.

_____

_____

_____

6.

_____

_____

_____

7. Given Circle P, write the equation of the circle. Then graph and write the equation of a new circle Q that is transformed $f(x-3)-5$.

Equation of Circle P _____   Equation of Circle Q _____

Domain: _____   Domain: _____
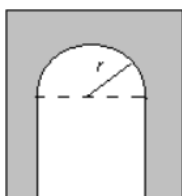
Range: _____   Range: _____

8. The face of a one lane tunnel in the figure is a square with a semi-circle above it. The semi-circle can be described by the equation $x^2 + y^2 = 81$. A truck 15 feet wide and 22 feet tall tries to drive through the tunnel. Will it make it? Justify your answer!

9. Find the center and radius of the following circle $x^2 + (y+3)^2 = 9$

10. Find the equation of the circle with center (-1, 3) and containing the point (-5, 6).