Circle
$A = C$

Warm-Up

February 3, 2017

Parabola
$A = 0$ or $C = 0$

Convert to standard form. Is it a circle or a parabola? Why?

$0x^2 - 4y^2 - 16x - 24y + 51 = 0$

$+16x \quad -51 \quad -51 + 16x$

$-4y^2 - 24y = 16x - 51$

$\frac{-4y^2}{-4} \quad \frac{-24y}{-4}$

$-4(y^2 + 6y + \square) = 16x - 51 - 4\square$

$-51 - 36$

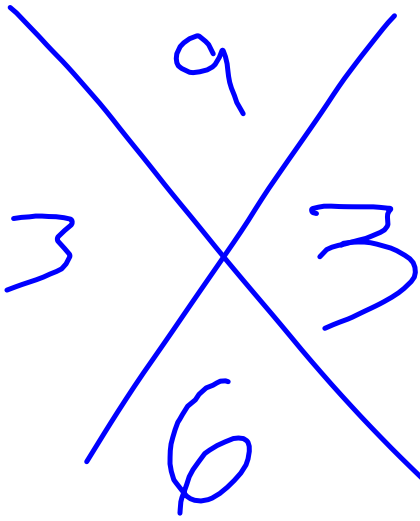
$-4(y+3)^2 = 16x - 87$

$\frac{-4(y+3)^2}{-4} = \frac{16\left(x - \frac{87}{16}\right)}{-4}$

$(y+3)^2 = -4\left(x - \frac{87}{16}\right)$

Transformational form

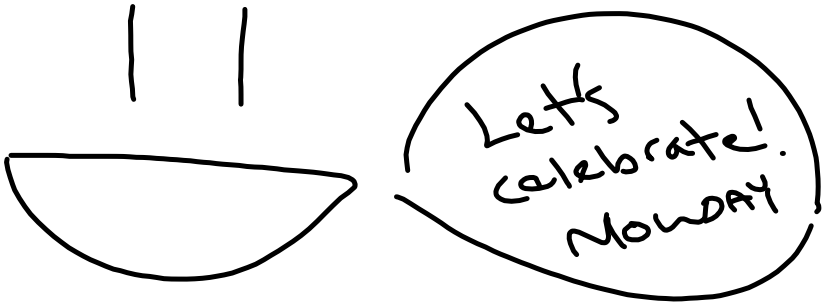
$y^2 + 6y + 9$



$(y+3)(y+3) = (y+3)^2$

4^2

$4 \cdot 4 = 16$


Lets
celebrate!
Monday

$$100x^2+100y^2-100x+240y-56=0$$

19. $-16y^2 + x + 320y - 1602 = 0$

$-x \qquad +1602 \quad +1602 - x$

$-16y^2 + 320y = -x + 1602$

$-16(y^2 - 20y + \boxed{100}) = -x + 1602 - 16\boxed{100}$

-1600

$-16(y-10)^2 = -x + 2$

$\frac{-16(y-10)^2}{-16} = \frac{-1(x-2)}{-16}$

$(y-10)^2 = \frac{1}{16}(x-2)$

19. $-16y^2 + x + 320y - 1602 = 0$

$-x \qquad +1602 \quad +1602 - x$

$-16y^2 + 320y = -x + 1602$

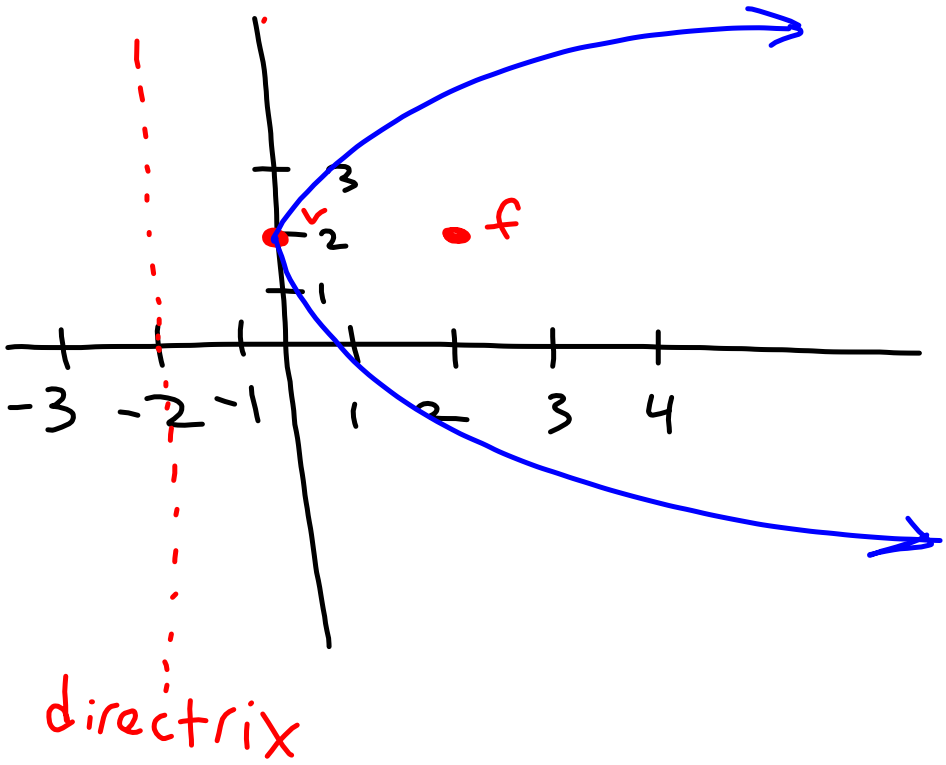
$-16(y^2 - 20y + \boxed{100}) = -x + 1602 - 16\boxed{100}$

$-16(y-10)^2 = -x + 1602 - 1600$

$-16(y-10)^2 = -x + 2$

$\frac{-16(y-10)^2}{-16} = \frac{-1(x-2)}{-16}$

$(y-10)^2 = \frac{1}{16}(x-2)$


3
2
1
f
-3
-2
-1
1
2
3
4
directrix

Transformational form

$(y-k)^2 = 4p(x-h)$ horizontal

$p>0$ ($p<0$)

$(x-h)^2 = 4p(y-k)$ vertical

$p>0$ U $p<0$ ∩

(h,k) vertex

Vertex form

$$\frac{(y-k)^2}{4p} = \frac{4p(x-h)}{4p}$$

$$\frac{1}{4p}(y-k)^2 = x - h$$
$$+h \qquad +h$$

$$x = \frac{1}{4p}(y-k)^2 + h$$

$$\frac{(x-h)^2}{4p} = \frac{4p(y-k)}{4p}$$

$$\frac{1}{4p}(x-h)^2 = y - k$$
$$+k \qquad +k$$

$$y = \frac{1}{4p}(x-h)^2 + k$$