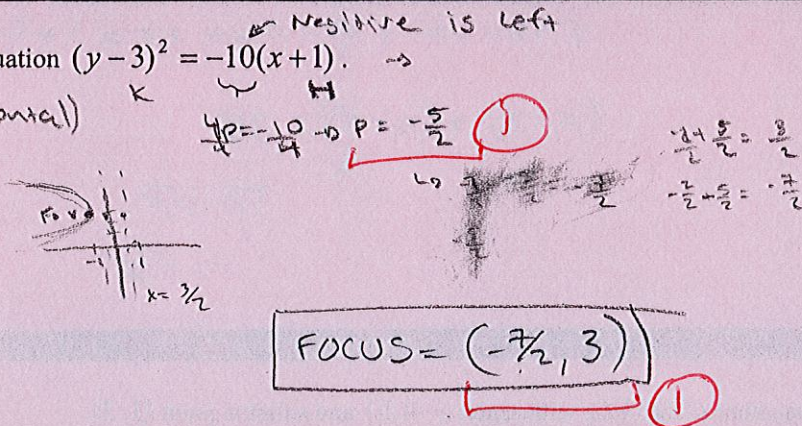


1. NO CALCULATORS ALLOWED

2. SHOW PROPER TO WORK TO RECEIVE FULL CREDIT

Find the focus of the parabola with equation $(y-3)^2 = -10(x+1)$.
 temp $\rightarrow y^2 = 4px$ (horizontal)
 vertex = $(-1, 3)$
 focus = $(-\frac{5}{2}, 3)$
 Directrix = $x = \frac{3}{2}$

SCORE: 3 / 3 POINTS



Find the standard form of the equations of the parabolas with the following characteristics.

SCORE: 5 / 5 POINTS

[a] focus $(\frac{1}{2}, 0)$ and vertex $(0, 0)$

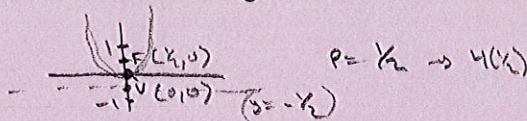
temp = $x^2 = 4py$ (vertical)

$$(x-0)^2 = 4(p)(y-0)$$

$\rightarrow$

$$x^2 = 2y$$

(*)

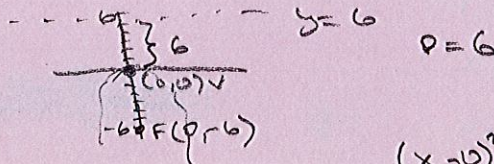


[b] directrix $y = 6$ and vertex $(0, 0)$

temp = $x^2 = 4py$ (vertical)

$$\text{Vertex} = (0, 0)$$

$$\text{Focus} = (0, -6)$$



$$(x-0)^2 = -24(y-0)$$

$$x^2 = -24y$$

Find the standard form of the equation of the parabola with focus $(7, 6)$ and directrix $x = -1$.

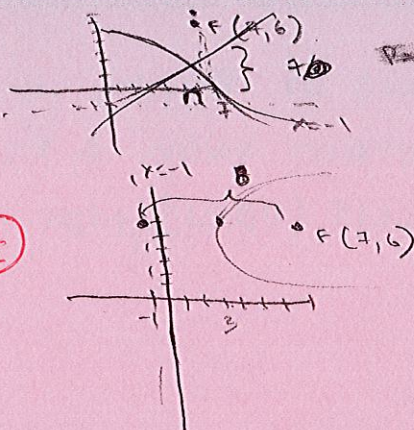
SCORE: 5 / 6 POINTS

$$\text{Focus} (7, 6)$$

$$\text{Directrix} = x = -1$$

$$\text{Vertex} = (3, 6)$$

$$\rightarrow (3, 6)$$



$$p = 4$$

$$p = 4$$

$$(y-6)^2 = 16(x-3)$$

(*)

Find the center and radius of the circle with equation $4x^2 + 4y^2 + 12x - 20y - 2 = 0$.

SCORE: ___ / 5 POINTS

Center = (h, k)

Center = $(-3, 5)$

radius = $\sqrt{35}$

$$4x^2 + 4y^2 + 12x - 20y - 2 = 0$$

$$x^2 + y^2 + 6x - 10y - 1 = 0$$

$$x^2 + \frac{6x}{2} + y^2 - \frac{10y}{2} = 1$$

$$x^2 + 6x + 9 + y^2 - 10y + 25 = 1 + 9 + 25$$

$$(x+3)^2 + (y-5)^2 = 35$$

$$r^2 = 35$$

$$r = \sqrt{35}$$

Write the standard form of the equation of the circle with center $(-4, 1)$ and solution point $(1, 3)$ (ie. the point lies on the circle).

SCORE: 3 / 3 POINTS

center = $(-4, 1)$
h k

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

$$(1-(-4))^2 + (3-1)^2 = r^2$$

$$5^2 + 2^2 = r^2$$

$$25 + 4 = r^2$$

$$29 = r^2$$

$$(x+4)^2 + (y-1)^2 = 29$$

Write the definition of a parabola. Use complete sentences and proper English as shown in lecture.

SCORE: 3 / 3 POINTS

A Parabola is the locus of points in the plane which are equidistant from a fixed line (directrix) and a fixed point (focus), not on the line.