

**KFUPM PREP MATH PROGRAM**  
**MATH002 – TERM 243**

**12.1 Recitation Exercises**

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1. Which one of the following is the equation in standard form of the parabola with directrix  $y = 7$  and focus  $(1,3)$

A)  $y - 5 = -\frac{1}{8}(x - 1)^2$

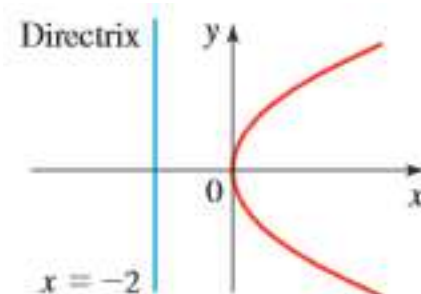
B)  $x - 5 = -\frac{1}{8}(x - 1)^2$

C)  $y - 5 = \frac{1}{8}(x - 1)^2$

D)  $x - 1 = \frac{1}{8}(y - 4)^2$

E)  $y - 5 = \frac{1}{4}(x - 1)^2$

2. Find an equation of the parabola from the given graph



3. Find the vertex, focus, and directrix of the parabola given by the equation:

$$3x^2 - 12x - y + 14 = 0$$

4. Which of the following points lies on the parabola that has vertex  $(2, 1)$  and focus  $(2, 3)$

A)  $(4, 2)$       B)  $(6, 3)$       C)  $(5, 3)$       D)  $(1, -3)$       E)  $(-1, 3)$

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**12.2 & 12.3 Recitation Exercises**

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1. Find the center, the vertices, foci, and eccentricity of the ellipse given by the equation

a)  $3x^2 + 2y^2 - 6x + 12y = -15$

b)  $3y^2 + 2x^2 - 6y + 12x = -15$

- 2.
- a) Find the equation of the ellipse that has vertices at (3,8) and (3, -2), and foci at (3,6) and (3,0).
- b) Find the equation in standard form, of the ellipse with foci at (-1,2) and (3,2) that passes through the point (3,5).

3. Find the points of intersection of the ellipse  $\frac{(x+1)^2}{16} + \frac{(y-2)^2}{9} = 1$ , and the hyperbola  $\frac{(x+1)^2}{16} - \frac{(y-2)^2}{9} = 1$  :

a) By solving the system of nonlinear equations.

b) By graphing.

4. Find the equation in standard form of the hyperbola with vertices (-1,0) and (-1, -4), and eccentricity  $e = \frac{\sqrt{5}}{2}$ .

5. Write the following equations in standard form and identify the corresponding conics

a)  $x^2 - 4x + y^2 + 2y + 2 = 0$ .

b)  $2x^2 - 8x - 2y^2 - 4y = 0$ .

c)  $27x^2 + 36y^2 + 18x + 36y - 96 = 0$ .