

Example a) Shifted Ellipses p. 7

Ch 11

Putting into the correct form

$$9x^2 - 36x + 4y^2 = 0$$

- Complete the square for the x's

Step 1: Factor out the leading coefficient

$$9(x^2 - 4x \quad) + 4y^2 = 0$$

Step 2: Complete the square

$$\left(\frac{1}{2} \cdot 4\right)^2 = (2)^2 = 4$$

So, $9(x^2 - 4x + 4) + 4y^2 = 0 + 36$

Remember $9 \cdot 4 = 36$ was added in the left, not 4!

Rewrite, $9(x - 2)^2 + 4y^2 = 36$

Getting 1 as the Constant

Step 3: Divide all terms by 36 to get constant equal to 1

$$\frac{9(x-2)^2}{36} + \frac{4y^2}{36} = \frac{36}{36}$$

So,

The Correct Form Is:

$$\frac{(x - 2)^2}{4} + \frac{y^2}{9} = 1$$

Meaning: $a^2 = 9$ & $b^2 = 4$

so, this ellipse has a major axis that is vertical