

Using complete sentences, write the distance based definition of "ellipse".

SCORE: 0 / 2 PTS

An ellipse is a conic formed from a plane intersecting a double-napped cone at an angle that creates an oval; the "ovalness" of which is determined the concept of eccentricity

Find the foci and vertices of the ellipse $3x^2 + 4y^2 + 6x - 24y - 9 = 0$.

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$$\begin{aligned}
 3x^2 + 6x + 4y^2 - 24y - 9 &= 0 \\
 3(x^2 + 2x) + 4(y^2 - 6y) &= 9 + 3 + 36 \\
 3(x+1)^2 + 4(y-3)^2 &= 48 \\
 \frac{(x+1)^2}{16} + \frac{(y-3)^2}{12} &= 1 \\
 \frac{16}{-12} \quad c &= \frac{\sqrt{16+12}}{\sqrt{4}} = 2 \\
 a &= 4 \quad b = 2\sqrt{3} \\
 \text{Center} &= (-1, 3) \\
 \text{Foci} &= (-3, 3) \text{ \& } (1, 3) \\
 \text{Vertices} &= (-5, 3) \text{ \& } (3, 3)
 \end{aligned}$$

The focus of a parabola is at the origin, and its vertex is at (3, 0).

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[a] Find the equation of the parabola.

$$\begin{aligned}
 (y-3)^2 &= 4px \\
 (y-3)^2 &= -12x
 \end{aligned}$$

[b] The latus rectum of a parabola is the line segment passing through the focus, perpendicular to the axis of symmetry, with both endpoints on the parabola. Find the co-ordinates of the endpoints of the latus rectum of the parabola in [a].

$$\begin{aligned}
 (y-3)^2 &= -12(0) \\
 (y-3)^2 &= 0 \\
 y &= 3
 \end{aligned}$$

Fill in the blanks. **NO NEED TO SHOW WORK.**

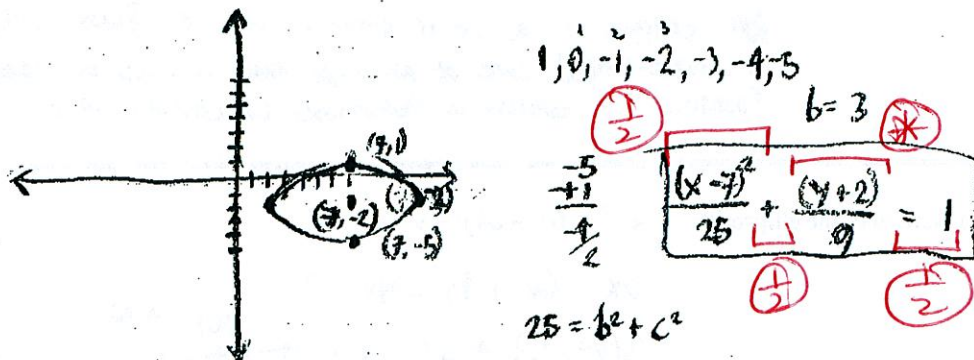
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[a] The midpoint of the minor axis of an ellipse is called the Center of the ellipse.

[b] The eccentricity of the ellipse $\frac{x^2}{6^2} + \frac{y^2}{10^2} = 1$ is $\frac{4}{5}$. $\frac{100}{64} \quad c = \frac{8}{10}$

Find the equation of the ellipse with foci $(7, -5)$ and $(7, 1)$, and a major axis of length 10.

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Find the vertex, focus and equation of the directrix of the parabola $2x^2 - 24x + y + 73 = 0$.

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