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- Which are the foci of $\frac{y^2}{4} - \frac{x^2}{25} = 1$? (Coordinates are rounded to the nearest tenth.)
[A] $(-4.6, 0), (4.6, 0)$ [B] $(0, -5.4), (0, 5.4)$ [C] $(-5.4, 0), (5.4, 0)$ [D] $(0, -4.6), (0, 4.6)$
- Determine the vertices, asymptotes, and foci of the hyperbola defined by $81x^2 - 4y^2 = 9$.
- Determine the vertices, asymptotes, and foci of the hyperbola defined by $324x^2 - 64y^2 = 576$.
- Determine the vertices, asymptotes, and foci of the hyperbola defined by $100x^2 - 9y^2 = 25$.
- Write an equation of a hyperbola that has vertices at $(-4, 0)$ and $(4, 0)$. Find the foci of your hyperbola.
- Determine the center and vertices for the following conic section: $18x^2 + 4y^2 - 72x + 16y = -16$
- Determine the center and vertices for the following conic section: $8x^2 + 4y^2 - 48x + 32y = -104$

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8. Determine the center and vertices for the following conic section: $18x^2 + 9y^2 - 144x + 36y = -162$

9. Determine the vertices, asymptotes, and foci of the hyperbola defined by $36x^2 - 16y^2 = 36$.

[A] vertices: $(\pm 1, 0)$, asymptotes: $y = \pm \frac{2}{3}x$, foci: $\left(\pm \frac{1}{2}\sqrt{13}, 0\right)$

[B] vertices: $\left(0, \pm \frac{3}{2}\right)$, asymptotes: $y = \pm \frac{2}{3}x$, foci: $\left(0, \pm \frac{1}{2}\sqrt{13}\right)$

[C] vertices: $\left(0, \pm \frac{3}{2}\right)$, asymptotes: $y = \pm \frac{3}{2}x$, foci: $\left(0, \pm \frac{1}{2}\sqrt{13}\right)$

[D] vertices: $(\pm 1, 0)$, asymptotes: $y = \pm \frac{3}{2}x$, foci: $\left(\pm \frac{1}{2}\sqrt{13}, 0\right)$

10. Identify and describe the conic defined by the following equation:

$$400x^2 - 3200x + 64y^2 - 384y = -6876$$

[A] circle with center: $(4, 3)$ and radius 10

[B] ellipse with vertices: $\left(4, 3 \pm \frac{5}{4}\right)$, foci at: $\left(4, 3 \pm \frac{1}{2}\sqrt{29}\right)$

[C] ellipse with vertices: $\left(4, 3 \pm \frac{5}{4}\right)$, foci at: $\left(4, 3 \pm \frac{1}{4}\sqrt{21}\right)$

[D] hyperbola with vertices: $\left(4, 3 \pm \frac{5}{4}\right)$, foci at: $\left(4, 3 \pm \frac{1}{2}\sqrt{21}\right)$

[1] B

[2] vertices: $\left(\pm\frac{1}{3}, 0\right)$, asymptotes: $y = \pm\frac{9}{2}x$, foci: $\left(\pm\frac{1}{6}\sqrt{85}, 0\right)$

[3] vertices: $\left(\pm\frac{4}{3}, 0\right)$, asymptotes: $y = \pm\frac{9}{4}x$, foci: $\left(\pm\frac{1}{3}\sqrt{97}, 0\right)$

[4] vertices: $\left(\pm\frac{1}{2}, 0\right)$, asymptotes: $y = \pm\frac{10}{3}x$, foci: $\left(\pm\frac{1}{6}\sqrt{109}, 0\right)$

[5] Answers may vary. Sample: $\frac{x^2}{16} - \frac{y^2}{9} = 1$; foci: $(-5, 0), (5, 0)$

[6] center: $(2, -2)$, vertices: $(2, -2 + 3\sqrt{2}) (2, -2 - 3\sqrt{2})$

[7] center: $(3, -4)$, vertices: $(3, -4 + 2\sqrt{2}) (3, -4 - 2\sqrt{2})$

[8] center: $(4, -2)$, vertices: $(4, -2 + 3\sqrt{2}) (4, -2 - 3\sqrt{2})$

[9] D

[10] C