

Assignment- Hyperbola

Date _____

Identify the vertices, foci, asymptotes, direction of opening, length of the transverse axis, length of the conjugate axis, length of the latus rectum, and eccentricity of each.

1) $\frac{x^2}{36} - \frac{y^2}{16} = 1$

2) $\frac{x^2}{64} - y^2 = 1$

3) $\frac{y^2}{121} - \frac{x^2}{49} = 1$

4) $\frac{x^2}{81} - \frac{y^2}{36} = 1$

5) $\frac{x^2}{121} - \frac{y^2}{169} = 1$

6) $\frac{y^2}{16} - \frac{x^2}{49} = 1$

7) $\frac{x^2}{25} - \frac{y^2}{121} = 1$

8) $4x^2 - 25y^2 - 400 = 0$

9) $-x^2 + y^2 - 100 = 0$

10) $-4x^2 + y^2 - 36 = 0$

11) $x^2 - 121y^2 - 121 = 0$

12) $-9x^2 + 49y^2 - 441 = 0$

13) $-x^2 + 4y^2 - 144 = 0$

14) $4x^2 - y^2 - 196 = 0$

Answers to Assignment- Hyperbola

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| <p>1) Vertices: $(6, 0), (-6, 0)$
 Foci: $(2\sqrt{13}, 0), (-2\sqrt{13}, 0)$
 Asym.: $y = \frac{2}{3}x$
 $y = -\frac{2}{3}x$
 Opens left/right
 Transverse Axis: 12 units
 Conjugate Axis: 8 units
 Latus Rectum: $\frac{16}{3}$ units
 Eccentricity: $\frac{\sqrt{13}}{3} \approx 1.202$</p> | <p>2) Vertices: $(8, 0), (-8, 0)$
 Foci: $(\sqrt{65}, 0), (-\sqrt{65}, 0)$
 Asym.: $y = \frac{1}{8}x$
 $y = -\frac{1}{8}x$
 Opens left/right
 Transverse Axis: 16 units
 Conjugate Axis: 2 units
 Latus Rectum: $\frac{1}{4}$ units
 Eccentricity: $\frac{\sqrt{65}}{8} \approx 1.008$</p> | <p>3) Vertices: $(0, 11), (0, -11)$
 Foci: $(0, \sqrt{170}), (0, -\sqrt{170})$
 Asym.: $y = \frac{11}{7}x$
 $y = -\frac{11}{7}x$
 Opens up/down
 Transverse Axis: 22 units
 Conjugate Axis: 14 units
 Latus Rectum: $\frac{98}{11}$ units
 Eccentricity: $\frac{\sqrt{170}}{11} \approx 1.185$</p> |
| <p>4) Vertices: $(9, 0), (-9, 0)$
 Foci: $(3\sqrt{13}, 0), (-3\sqrt{13}, 0)$
 Asym.: $y = \frac{2}{3}x$
 $y = -\frac{2}{3}x$
 Opens left/right
 Transverse Axis: 18 units
 Conjugate Axis: 12 units
 Latus Rectum: 8 units
 Eccentricity: $\frac{\sqrt{13}}{3} \approx 1.202$</p> | <p>5) Vertices: $(11, 0), (-11, 0)$
 Foci: $(\sqrt{290}, 0), (-\sqrt{290}, 0)$
 Asym.: $y = \frac{13}{11}x$
 $y = -\frac{13}{11}x$
 Opens left/right
 Transverse Axis: 22 units
 Conjugate Axis: 26 units
 Latus Rectum: $\frac{338}{11}$ units
 Eccentricity: $\frac{\sqrt{290}}{11} \approx 1.548$</p> | <p>6) Vertices: $(0, 4), (0, -4)$
 Foci: $(0, \sqrt{65}), (0, -\sqrt{65})$
 Asym.: $y = \frac{4}{7}x$
 $y = -\frac{4}{7}x$
 Opens up/down
 Transverse Axis: 8 units
 Conjugate Axis: 14 units
 Latus Rectum: $\frac{49}{2}$ units
 Eccentricity: $\frac{\sqrt{65}}{4} \approx 2.016$</p> |
| <p>7) Vertices: $(5, 0), (-5, 0)$
 Foci: $(\sqrt{146}, 0), (-\sqrt{146}, 0)$
 Asym.: $y = \frac{11}{5}x$
 $y = -\frac{11}{5}x$
 Opens left/right
 Transverse Axis: 10 units
 Conjugate Axis: 22 units
 Latus Rectum: $\frac{242}{5}$ units
 Eccentricity: $\frac{\sqrt{146}}{5} \approx 2.417$</p> | <p>8) Vertices: $(10, 0), (-10, 0)$
 Foci: $(2\sqrt{29}, 0), (-2\sqrt{29}, 0)$
 Asym.: $y = \frac{2}{5}x$
 $y = -\frac{2}{5}x$
 Opens left/right
 Transverse Axis: 20 units
 Conjugate Axis: 8 units
 Latus Rectum: $\frac{16}{5}$ units
 Eccentricity: $\frac{\sqrt{29}}{5} \approx 1.077$</p> | <p>9) Vertices: $(0, 10), (0, -10)$
 Foci: $(0, 10\sqrt{2}), (0, -10\sqrt{2})$
 Asym.: $y = x$
 $y = -x$
 Opens up/down
 Transverse Axis: 20 units
 Conjugate Axis: 20 units
 Latus Rectum: 20 units
 Eccentricity: $\sqrt{2} \approx 1.414$</p> |

10) Vertices: $(0, 6), (0, -6)$
 Foci: $(0, 3\sqrt{5}), (0, -3\sqrt{5})$
 Asym.: $y = 2x$
 $y = -2x$
 Opens up/down
 Transverse Axis: 12 units
 Conjugate Axis: 6 units
 Latus Rectum: 3 units
 Eccentricity: $\frac{\sqrt{5}}{2} \approx 1.118$

11) Vertices: $(11, 0), (-11, 0)$
 Foci: $(\sqrt{122}, 0), (-\sqrt{122}, 0)$
 Asym.: $y = \frac{1}{11}x$
 $y = -\frac{1}{11}x$
 Opens left/right
 Transverse Axis: 22 units
 Conjugate Axis: 2 units
 Latus Rectum: $\frac{2}{11}$ units
 Eccentricity: $\frac{\sqrt{122}}{11} \approx 1.004$

12) Vertices: $(0, 3), (0, -3)$
 Foci: $(0, \sqrt{58}), (0, -\sqrt{58})$
 Asym.: $y = \frac{3}{7}x$
 $y = -\frac{3}{7}x$
 Opens up/down
 Transverse Axis: 6 units
 Conjugate Axis: 14 units
 Latus Rectum: $\frac{98}{3}$ units
 Eccentricity: $\frac{\sqrt{58}}{3} \approx 2.539$

13) Vertices: $(0, 6), (0, -6)$
 Foci: $(0, 6\sqrt{5}), (0, -6\sqrt{5})$
 Asym.: $y = \frac{1}{2}x$
 $y = -\frac{1}{2}x$
 Opens up/down
 Transverse Axis: 12 units
 Conjugate Axis: 24 units
 Latus Rectum: 48 units
 Eccentricity: $\sqrt{5} \approx 2.236$

14) Vertices: $(7, 0), (-7, 0)$
 Foci: $(7\sqrt{5}, 0), (-7\sqrt{5}, 0)$
 Asym.: $y = 2x$
 $y = -2x$
 Opens left/right
 Transverse Axis: 14 units
 Conjugate Axis: 28 units
 Latus Rectum: 56 units
 Eccentricity: $\sqrt{5} \approx 2.236$