Math Worksheets

Hyperbola in Standard Form

Use the information provided to write the standard form equation of each hyperbola.

1) $-11x^2 + 14y^2 + 66x - 224y + 643 = 0$

2) $-x^2 + y^2 - 12x - 10y - 75 = 0$

3) $-4x^2 + y^2 + 24x + 4y - 48 = 0$

4) $x^2 - 9y^2 - 6x + 90y - 297 = 0$

5) Vertices: (5, 6), (–3, 6), Conjugate Axis is 8 units long

6) Vertices: (6, 1), (6, –23), Distance from Center to Focus = $4\sqrt{13}$

7) Vertices: (–7, 23), (–7, –7), Distance from Center to Focus = $5\sqrt{13}$

8) Vertices: (–3, –3), (–21, –3), Asymptotes: $y = x + 9$, $y = -x - 15$

9) Foci: (7, 2), (7, –10); Conjugate Axis is 12 units long

10) Foci: $(9, -3 + \sqrt{73})$, $(9, -3 - \sqrt{73})$, Endpoints of Conjugate Axis: (17, –3), (1, –3)

Identify the vertices, foci, and direction of opening of each.

11) $\frac{y^2}{64} - \frac{x^2}{25} = 1$

12) $\frac{x^2}{169} - \frac{y^2}{64} = 1$

13) $\frac{x^2}{100} - \frac{y^2}{36} = 1$

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

15) $\frac{(x+3)^2}{144} - \frac{(y+7)^2}{25} = 1$

16) $\frac{(y+9)^2}{81} - \frac{(x+4)^2}{64} =$

Answers of Worksheets

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1) $\frac{(y-8)^2}{11} - \frac{(x-3)^2}{14} = 1$

2) $\frac{(y-5)^2}{64} - \frac{(x+6)^2}{64} = 1$

3) $\frac{(y+2)^2}{16} - \frac{(x-3)^2}{4} = 1$

4) $\frac{(x-3)^2}{81} - \frac{(y-5)^2}{9} = 1$

5) $\frac{(x-1)^2}{16} - \frac{(y-6)^2}{121} = 1$

6) $\frac{(y+11)^2}{144} - \frac{(x-6)^2}{64} = 1$

7) $\frac{(y-8)^2}{225} - \frac{(x+7)^2}{100} = 1$

8) $\frac{(x+12)^2}{81} - \frac{(y+3)^2}{81} = 1$

9) $\frac{(y+4)^2}{36} - \frac{(x-7)^2}{36} = 1$

10) $\frac{(y+3)^2}{9} - \frac{(x-9)^2}{64} = 1$

11) Vertices: (0, 8), (0, –8); Foci: $(0, \sqrt{89})$, $(0, -\sqrt{89})$; Opens up/down

12) Vertices: (13, 0), (–13, 0); Foci: $(\sqrt{233}, 0)$, $(-\sqrt{233}, 0)$; Opens left/right

13) Vertices: (10, 0), (–10, 0); Foci: $(2\sqrt{34}, 0)$, $(-2\sqrt{34}, 0)$; Opens left/right

14) Vertices: (7, 0), (–7, 0); Foci: $(\sqrt{65}, 0)$, $(-\sqrt{65}, 0)$; Opens left/right

15) Vertices: (9, –7), (–15, –7); Foci: (10, –7), (–16, –7); Opens left/right

16) Vertices: (–4, 0), (–4, –18); Foci: $(-4, -9 + \sqrt{145})$, $(-4, -9 - \sqrt{154})$; Opens up/down