

Math Sheet

Name _____ Score _____ / 8 Teacher _____ Date _____

Writing Equations of Hyperbolas

Use the given information to write each hyperbola in standard form.

1. Vertices: $(5, -6)$, $(-13, -6)$
Center-to-focus distance: $9\sqrt{2}$

2. Vertices: $(-8, 2)$, $(-8, 0)$
Conjugate-axis length: 2

3. Vertices: $(-1, 7)$, $(-3, 7)$
Conjugate endpoints: $(-2, 15)$, $(-2, -1)$

4. Foci: $(3, 8 + \sqrt{61})$, $(3, 8 - 1\sqrt{61})$
Asymptotes: $y = \frac{6}{5}x + \frac{22}{5}$, $y = -\frac{6}{5}x + \frac{58}{5}$

5. Foci: $(2, -3 + 2\sqrt{17})$, $(2, -3 - 2\sqrt{17})$
Conjugate-axis length: 4

6. $4x^2 - 1y^2 - 48x + 16y + 76 = 0$

7. Vertices: $(17, 8)$, $(-7, 8)$
Asymptotes: $y = \frac{3}{4}x + \frac{17}{4}$, $y = -\frac{3}{4}x + \frac{47}{4}$

8. Vertices: $(0, 11)$, $(0, 3)$
Foci: $(0, 7 + \sqrt{65})$, $(0, 7 - 1\sqrt{65})$

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Writing Equations of Hyperbolas

Answer Key

Use the given information to write each hyperbola in standard form.

1. Vertices: (5,-6), (-13, -6)

Center-to-focus distance: $9\sqrt{2}$

Standard form: $\frac{(x+4)^2}{81} - \frac{(y+6)^2}{81} = 1$

2. Vertices: (-8, 2), (-8, 0)

Conjugate-axis length: 2

Standard form: $\frac{(y-1)^2}{1} - \frac{(x+8)^2}{1} = 1$

3. Vertices: (-1, 7), (-3, 7)

Conjugate endpoints: (-2, 15), (-2, -1)

Standard form: $\frac{(x+2)^2}{1} - \frac{(y-7)^2}{64} = 1$

4. Foci: $(3, 8 + \sqrt{61})$, $(3, 8 - \sqrt{61})$

Asymptotes: $y = \frac{6}{5}x + \frac{22}{5}$, $y = -\frac{6}{5}x + \frac{58}{5}$

Standard form: $\frac{(y-8)^2}{36} - \frac{(x-3)^2}{25} = 1$

5. Foci: $(2, -3 + 2\sqrt{17})$, $(2, -3 - 2\sqrt{17})$

Conjugate-axis length: 4

Standard form: $\frac{(y+3)^2}{64} - \frac{(x-2)^2}{4} = 1$

6. $4x^2 - 1y^2 - 48x + 16y + 76 = 0$

Standard form: $\frac{(x-6)^2}{1} - \frac{(y-8)^2}{4} = 1$

7. Vertices: (17, 8), (-7, 8)

Asymptotes: $y = \frac{3}{4}x + \frac{17}{4}$, $y = -\frac{3}{4}x + \frac{47}{4}$

Standard form: $\frac{(x-5)^2}{144} - \frac{(y-8)^2}{81} = 1$

8. Vertices: (0, 11), (0, 3)

Foci: $(0, 7 + \sqrt{65})$, $(0, 7 - \sqrt{65})$

Standard form: $\frac{(y-7)^2}{16} - \frac{x^2}{49} = 1$