Name : _____ Score : _____

Teacher : _____ Date : _____

# Properties of Hyperbolas

**Identify the following properties.**

1) $\frac{(x - 2)^2}{36} - \frac{(y - 3)^2}{9} = 1$

Vertices:

Foci:

Opens:

2) $\frac{(x + 7)^2}{100} - \frac{(y + 3)^2}{49} = 1$

Vertices:

Foci:

Opens:

3) $\frac{(y + 3)^2}{100} - \frac{(x + 6)^2}{9} = 1$

Vertices:

Foci:

Opens:

4) $\frac{(y - 7)^2}{36} - \frac{(x - 4)^2}{25} = 1$

Vertices:

Foci:

Opens:

5) $\frac{(y + 1)^2}{81} - \frac{(x - 7)^2}{36} = 1$

Vertices:

Foci:

Opens:

6) $\frac{(x + 4)^2}{100} - \frac{(y - 2)^2}{25} = 1$

Vertices:

Foci:

Opens:

7) $\frac{(y - 5)^2}{81} - \frac{(x - 7)^2}{25} = 1$

Vertices:

Foci:

Opens:

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

Vertices:

Foci:

Opens:

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# Properties of Hyperbolas

**Identify the following properties.**

1) $\frac{(x - 2)^2}{36} - \frac{(y - 3)^2}{9} = 1$

Vertices = (8 , 3) , (-4 , 3)

Opens left/right

Foci = $(2 + 3\sqrt{5}\ , 3)$ , $(2 - 3\sqrt{5}\ , 3)$

2) $\frac{(x + 7)^2}{100} - \frac{(y + 3)^2}{49} = 1$

Vertices = (3 , -3) , (-17 , -3)

Opens left/right

Foci = $(-7 + \sqrt{149}\ , -3)$ , $(-7 - \sqrt{149}\ , -3)$

3) $\frac{(y + 3)^2}{100} - \frac{(x + 6)^2}{9} = 1$

Vertices = (-6 , 7) , (-6 , -13)

Opens up/down

Foci = $(-6 , -3 + \sqrt{109}\ )$ , $(-6 , -3 - \sqrt{109}\ )$

4) $\frac{(y - 7)^2}{36} - \frac{(x - 4)^2}{25} = 1$

Vertices = (4 , 13) , (4 , 1)

Opens up/down

Foci = $(4 , 7 + \sqrt{61}\ )$ , $(4 , 7 - \sqrt{61}\ )$

5) $\frac{(y + 1)^2}{81} - \frac{(x - 7)^2}{36} = 1$

Vertices = (7 , 8) , (7 , -10)

Opens up/down

Foci = $(7 , -1 + 3\sqrt{13}\ )$ , $(7 , -1 - 3\sqrt{13}\ )$

6) $\frac{(x + 4)^2}{100} - \frac{(y - 2)^2}{25} = 1$

Vertices = (6 , 2) , (-14 , 2)

Opens left/right

Foci = $(-4 + 5\sqrt{5}\ , 2)$ , $(-4 - 5\sqrt{5}\ , 2)$

7) $\frac{(y - 5)^2}{81} - \frac{(x - 7)^2}{25} = 1$

Vertices = (7 , 14) , (7 , -4)

Opens up/down

Foci = $(7 , 5 + \sqrt{106}\ )$ , $(7 , 5 - \sqrt{106}\ )$

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

Vertices = (-3 , -1) , (-3 , -7)

Opens up/down

Foci = $(-3 , -4 + \sqrt{13}\ )$ , $(-3 , -4 - \sqrt{13}\ )$