Name _____ Date _____ Class _____

LESSON 12-4

Practice B

Hyperbolas

Find the constant difference for a hyperbola with the given foci and point on the hyperbola.

1. $F_1(0, 11)$, $F_2(0, -11)$, $P(0, 7)$

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2. $F_1(-9, 0)$, $F_2(9, 0)$, $P(-8, 0)$

_____

Write an equation in standard form for each hyperbola with center (0, 0).

3. Co-vertex (–16, 0), focus (0, –20)

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4. Vertex (24, 0), focus (–25, 0)

_____

5. Vertex (0, –17), co-vertex (1, 0)

_____

6. Vertex (30, 0), focus (–40, 0)

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Find the vertices, co-vertices, and asymptotes of each hyperbola, and then graph.

7. $\frac{x^2}{196} - \frac{y^2}{49} = 1$

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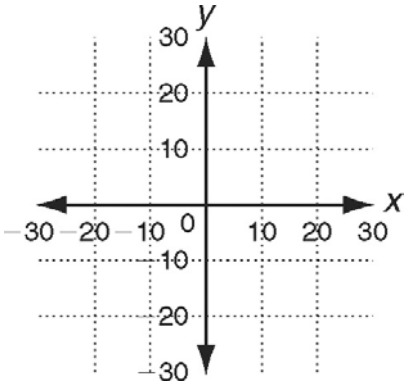
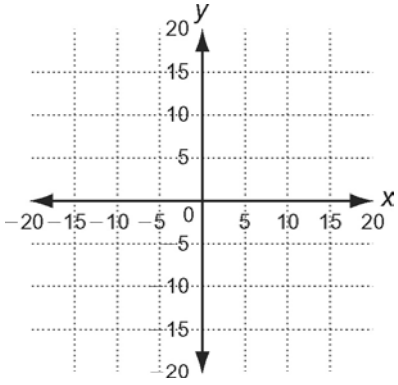


8. $\frac{(y-4)^2}{36} - \frac{x^2}{81} = 1$

_____

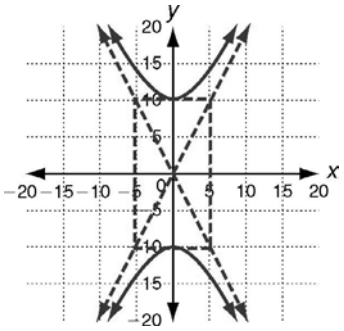


Solve.

9. A comet's path as it approaches the sun is modeled by one branch of the hyperbola $\frac{y^2}{1122} - \frac{x^2}{39{,}355} = 1$, where the sun is at the corresponding focus. Each unit of the coordinate plane represents one million miles. How close does the comet come to the sun?

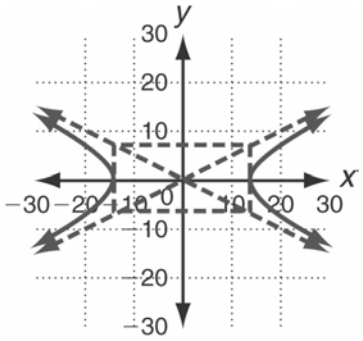
_____

e.

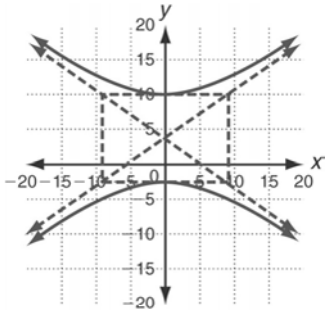


Practice B

1. 14
2. 16
3. $\frac{y^2}{144} - \frac{x^2}{256} = 1$
4. $\frac{x^2}{576} - \frac{y^2}{49} = 1$
5. $\frac{y^2}{289} - \frac{x^2}{1} = 1$
6. $\frac{x^2}{900} - \frac{y^2}{700} = 1$
7. Vertices: (14, 0), (–14, 0); co-vertices: (0, 7), (0, –7); asymptotes: $y = \frac{1}{2}x, y = -\frac{1}{2}x$



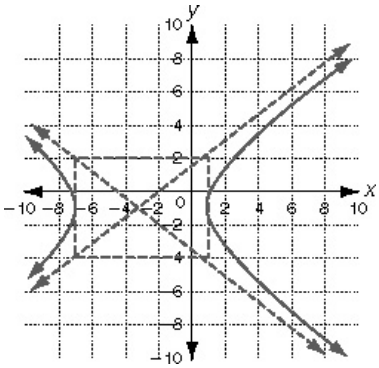
8. Vertices: (0, 10), (0, –2); co-vertices: (9, 4), (–9, 4);
   asymptotes: $y = \frac{2}{3}x + 4, y = -\frac{2}{3}x + 4$



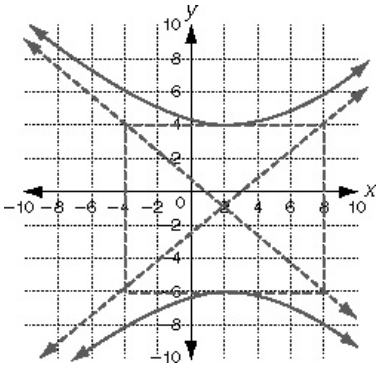
9. 167.7 million miles

Practice C

1. $\frac{x^2}{64} - \frac{y^2}{4} = 1$
2. $\frac{x^2}{1600} - \frac{y^2}{81} = 1$
3. $\frac{y^2}{36} - \frac{(x-5)^2}{1} = 1$
4. $\frac{(x+4)^2}{64} - \frac{(y-2)^2}{36} = 1$
5. $\frac{(y-1)^2}{144} - \frac{(x+2)^2}{25} = 1$
6. Vertices: (1, –1), (–7, –1); co-vertices: (–3, 2), (–3, –4); asymptotes: $y = -1 + \frac{3}{4}(x + 3), y = -1 - \frac{3}{4}(x + 3)$



7. Vertices: (2, 4), (2, –6); co-vertices: (8, –1), (–4, –1); asymptotes: $y = -1 + \frac{5}{6}(x - 2), y = -1 - \frac{5}{6}(x - 2)$



8. a. (0, 205.99)
   b. 172.88 million miles

Reteach

1. Horizontally
   $a = 3$ $b = 2$
   $\frac{x^2}{9} - \frac{y^2}{4} = 1$