



MIXED REVIEW FOR TEKS

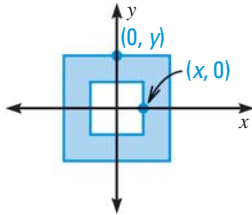
Lessons 9.5–9.7

MULTIPLE CHOICE

1. **WHISPER DISHES** A person at the focus of one of two facing parabolic dishes can hear a soft sound made at the focus of the other dish. The California Science Center in Los Angeles has two such “whisper dishes” whose vertices are about 47 feet apart. Each dish’s focus is about 1.5 feet from its vertex. What are equations for the cross sections of the dishes if one dish’s vertex is at the origin and the other dish’s vertex is on the positive x -axis? **TEKS 2A.5.B**

- (A) $y^2 = 1.5x; y^2 = 1.5(x - 47)$
 (B) $y^2 = 6x; y^2 = 6(x - 47)$
 (C) $y^2 = 1.5x; y^2 = -1.5(x - 47)$
 (D) $y^2 = 6x; y^2 = -6(x - 47)$

2. **MODELING AREA** The shaded region shown below is formed by two squares centered at the origin. The area of the shaded region is 28 square units. Which equation describes the possible values of x and y ? **TEKS 2A.5.B**



- (F) $\frac{x^2}{7} - \frac{y^2}{7} = 1$ (G) $\frac{y^2}{7} - \frac{x^2}{7} = 1$
 (H) $\frac{x^2}{28} - \frac{y^2}{80} = 1$ (J) $\frac{y^2}{28} - \frac{x^2}{28} = 1$

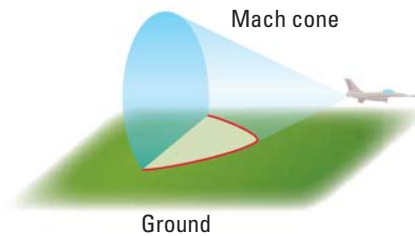
3. **HYPERBOLIC MIRROR** A hyperbolic mirror reflects light rays directed toward one focus to the other focus. A certain hyperbolic mirror can be represented by the right branch of the hyperbola with this equation:

$$\frac{x^2}{64} - \frac{y^2}{80} = 1$$

If light from point $(0, 9)$ is directed at the focus at $(12, 0)$, at approximately what point on the mirror will the light be reflected to the focus at $(-12, 0)$? **TEKS a.4**

- (A) $(4.8, 5.4)$ (B) $(5.1, 5.2)$
 (C) $(7.5, 3.4)$ (D) $(8.4, 2.7)$

4. **AVIATION** When a jet breaks the sound barrier, sound waves form a “Mach cone” behind the jet, and a sonic boom is heard as the cone passes. The Mach cone for a jet in level flight meets the ground in a hyperbola with the jet directly above the center. Suppose a jet makes a sonic boom heard along the hyperbola $\frac{x^2}{36} - \frac{y^2}{100} = 1$ where x and y are in miles. What is the shortest possible horizontal distance you could be from the jet when you first hear the boom? **TEKS 2A.5.B**

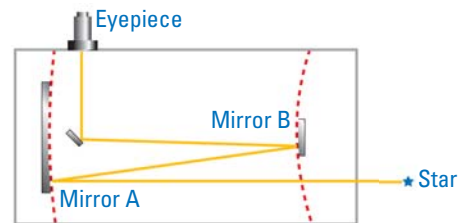


- (F) 4 miles (G) 6 miles
 (H) 10 miles (J) 11.7 miles

5. **CASSEGRAIN TELESCOPE** The diagram shows the mirrors in a Cassegrain telescope. The equations of the mirrors are given below. Which type of conic section does the surface of mirror B represent? **TEKS 2A.5.D**

Mirror A: $y^2 - 72x - 450 = 0$

Mirror B: $88.4x^2 - 49.7y^2 - 4390 = 0$



- (A) Circle (B) Parabola
 (C) Ellipse (D) Hyperbola

GRIDDED ANSWER

6. **LOGO** A company’s logo contains intersecting ellipses with equations $x^2 + 4y^2 = 16$ and $9x^2 + y^2 + 8y = 20$. What is the y -coordinate of the uppermost point of intersection? **TEKS 2A.5.B**