Find the exact value of the indicated trigonometric function of θ.

1) $\sin \theta = -\dfrac{4}{9}, \quad \tan \theta > 0$ Find $\sec \theta$.

Solve.

2) The amount of paint needed to cover the walls of a room varies jointly as the perimeter of the room and the height of the wall. If a room with a perimeter of 65 feet and 6–foot walls requires 3.9 quarts of paint, find the amount of paint needed to cover the walls of a room with a perimeter of 45 feet and 8–foot walls.

Solve the problem. Leave your answer in polar form.

3) $z = 1 - i$

$w = 1 - \sqrt{3}i$

Find $\dfrac{z}{w}$.

Solve the equation.

4) $9^{2x} \cdot 27^{(3-x)} = \dfrac{1}{9}$

5) $\log_2 (x+1) + \log_2 (x-5) = 4$

Two sides and an angle are given. Determine whether the given information results in one triangle, two triangles, or no triangle at all. Solve any triangle(s) that results.

6) $a = 46, \quad b = 16, \quad \beta = 10°$

Use a graphing utility to graph the function over the indicated interval and approximate any local maxima and local minima. If necessary, round answers to two decimal places.

7) $f(x) = x^3 - 12x + 2; \ (-5, 5)$

Find the exact value of the expression.

8) $\cos\left[\sin^{-1}\dfrac{1}{4}\right]$

Write the complex number in polar form. Express the argument in degrees.

9) $3 - 3i$

Simplify the expression as far as possible.

10) $\dfrac{\cos \theta}{1 + \sin \theta} + \tan \theta$

Find an equation for the parabola satisfying the stated conditions.

11) Vertex at (8, –3); focus at (7, –3)

Solve the problem.

12) A ship sailing parallel to shore sights a lighthouse at an angle of 13° from its direction of travel. After traveling 2 miles farther, the angle is 20°. At that time, how far is the ship from the lighthouse?

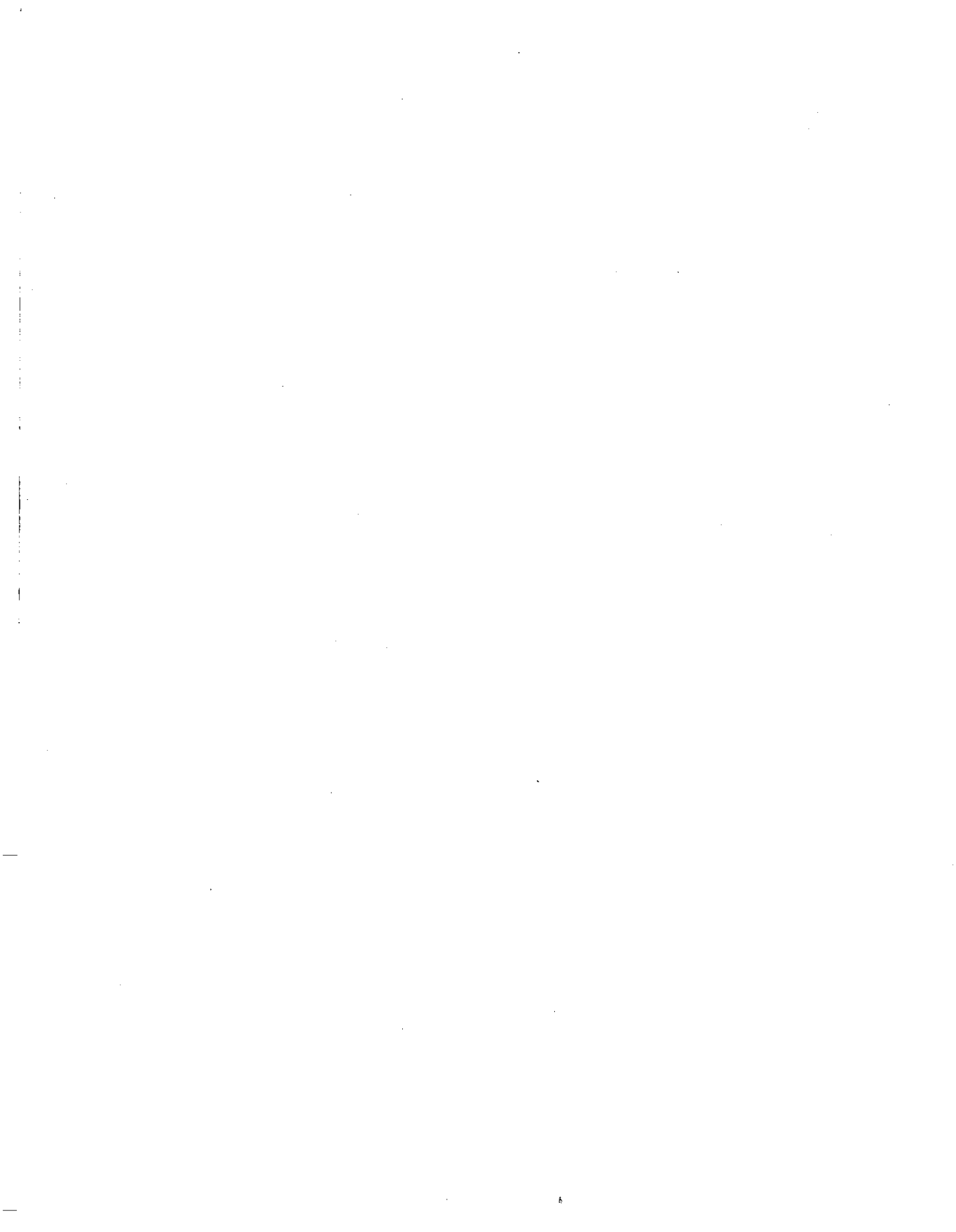**Find an equation for the hyperbola satisfying the stated conditions.**

13) Vertices at (±7, 0); foci at (±8, 0)

Solve the equation algebraically.

14) $\dfrac{-3x + 2}{3} + \dfrac{4x}{3} = -\dfrac{7}{3}$

Find the exact value of the expression. Do not use a calculator.

15) $\cos\dfrac{\pi}{3} + \tan\dfrac{5\pi}{3}$

Precalculus
Cumulative Review
Chapters 1 – 9 (I)

NAME _____

_____

_____

_____

You will receive a cumulative review at the end of certain chapters to be handed in one week later. This will be graded but you may work in study groups if you wish. All work for each problem must be done in the boxes for credit.

1. $\sec \theta = $ _____   (Show manual computation on worksheet)

2.   _____

3. $\dfrac{z}{w} = $ _____

4. $x = $ _____

5. $x = $ _____

6.   _____ use the number of spaces necessary below:

$\alpha_1 = $ _____ $\alpha_2 = $ _____

$\gamma_1 = $ _____ $\gamma_2 = $ _____

$c_1 = $ _____ $c_2 = $ _____

7.   Maximum_____   Minimum_____

8.   _____

9.   _____   13.   _____

10.   _____   14. $x = $ _____

11.   _____   15.   _____

12.   _____

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15

1) $-\dfrac{9\sqrt{65}}{65}$

2) 3.6 quarts

3) $\dfrac{\sqrt{2}}{2}\left(\cos 15° + i \sin 15°\right)$

4) $\{-11\}$

5) $\{7\}$

6) two triangles
$\alpha_1 = 29.95°, \gamma_1 = 140.05°, c_1 = 59.16$ or
$\alpha_2 = 150.05°, \gamma_2 = 19.95°, c_2 = 31.44$

7) local maximum at $(-2, 18)$
local minimum at $(2, -14)$

8) $\dfrac{\sqrt{15}}{4}$

9) $3\sqrt{2}(\cos 315° + i \sin 315°)$

10) $\sec \theta$

11) $(y + 3)^2 = -4(x - 8)$

12) 3.69 mi

13) $\dfrac{x^2}{49} - \dfrac{y^2}{15} = 1$

14) $\{-9\}$

15) $\dfrac{1 - 2\sqrt{3}}{2}$