

## Gateway Test 3A

### Trigonometry

1. If  $\csc \theta = \frac{13}{5}$  and  $\theta$  is in the second quadrant, find  $\sec \theta$ .

2. Find all  $\theta$  in the interval  $[0, 2\pi)$  that satisfy the equation.

$$\sin 2\theta = 0$$

3. Write the expression  $\sqrt{x^2 + 4}$  in terms of  $\theta$  when  $x = 2 \tan \theta$ .

4. Simplify  $\frac{\cot \theta}{\csc \theta}$ .

5. Find  $\sin 2A$  if  $\sin A = \frac{1}{4}$  and  $0 \leq A \leq \frac{\pi}{2}$ .

6. Find all  $\theta$  in the interval  $[0, 2\pi)$  that satisfy the equation.

$$2 \cos \theta \tan \theta + \tan \theta = 0$$

7. If  $\cos 2\theta = \frac{1}{3}$  and  $0 \leq 2\theta \leq \pi$ , find  $\cos \theta$ .

8. Rewrite the given equation using the substitutions  $x = r \cos \theta$  and  $y = r \sin \theta$ . Simplify your answer.

$$x^2 + y^2 + 3x = 0$$

9. Write the given expression in algebraic form.

$$\tan\left(\arccos \frac{x}{3}\right)$$

10. Compute  $\arcsin\left(-\frac{1}{2}\right)$ .

## Gateway Test 3B

### Trigonometry

1. If  $\cot \theta = \frac{4}{3}$  and  $\theta$  is in the third quadrant, find  $\cos \theta$ .

2. Find all  $\theta$  in the interval  $[0, 2\pi)$  that satisfy the equation.

$$\sin 2\theta = \frac{1}{2}$$

3. Write the expression  $\sqrt{9 - x^2}$  in terms of  $\theta$  when  $x = 3 \sin \theta$ .

4. Simplify  $\frac{\sec \theta}{\tan \theta}$ .

5. Find  $\cos 2A$  if  $\sin A = \frac{1}{4}$  and  $0 \leq A \leq \frac{\pi}{2}$ .

6. Find all  $\theta$  in the interval  $[0, 2\pi)$  that satisfy the equation.

$$\sin \theta - \sin \theta \cot \theta = 0$$

7. If  $\cos 2\theta = \frac{1}{3}$  and  $0 \leq 2\theta \leq \pi$ , find  $\sin \theta$ .

8. Rewrite the given equation using the substitutions  $x = r \cos \theta$  and  $y = r \sin \theta$ . Simplify your answer.

$$x^2 + y^2 - 2y = 0$$

9. Write the given expression in algebraic form.

$$\cot\left(\arcsin \frac{x}{2}\right)$$

10. Compute  $\arccos\left(-\frac{\sqrt{3}}{2}\right)$ .

**Test 3A**

1.  $-\frac{13}{12}$
2.  $0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}$
3.  $2|\sec \theta|$
4.  $\cos \theta$
5.  $\frac{\sqrt{15}}{8}$
6.  $0, \frac{2\pi}{3}, \pi, \frac{4\pi}{3}$
7.  $\sqrt{\frac{2}{3}}$
8.  $r = -3 \cos \theta$
9.  $\frac{\sqrt{9-x^2}}{x}$
10.  $-\frac{\pi}{6}$

**Test 3B**

1.  $-\frac{4}{5}$
2.  $\frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$
3.  $3|\cos \theta|$
4.  $\csc \theta$
5.  $\frac{7}{8}$
6.  $0, \frac{\pi}{4}, \pi, \frac{5\pi}{4}$
7.  $\frac{1}{\sqrt{3}}$
8.  $r = 2 \sin \theta$
9.  $\frac{\sqrt{4-x^2}}{x}$
10.  $\frac{5\pi}{6}$