

## Chapter 5 Prerequisite Skills

BLM 5-1

**Trigonometric Ratios of Angles Using Radian Measure**

1. Use a calculator to evaluate each trigonometric ratio, to four decimal places.

a)  $\tan \frac{\pi}{7}$                       b)  $\sin \frac{3\pi}{5}$   
 c)  $\cos \frac{7\pi}{9}$                       d)  $\tan \frac{11\pi}{12}$

2. Use a calculator to evaluate each trigonometric ratio, to four decimal places.

a)  $\csc 3.12$                       b)  $\cot 0.56$   
 c)  $\sec 2.31$                       d)  $\csc 1.17$

**Exact Trigonometric Ratios of Special Angles Using Radian Measure**

3. Determine the exact value of each trigonometric ratio.

a)  $\sin \frac{3\pi}{4}$                       b)  $\tan \frac{5\pi}{6}$   
 c)  $\cos \pi$                       d)  $\sec \frac{\pi}{6}$   
 e)  $\csc \frac{2\pi}{3}$                       f)  $\cot \frac{5\pi}{4}$

**Graphs and Transformations of Sinusoidal Functions Using Degree Measure**

4. Sketch the graph of  $y = \cos x$  on the interval  $x \in [0^\circ, 360^\circ]$
5. Sketch the graph of  $y = \sin x$  on the interval  $x \in [-180^\circ, 540^\circ]$
6. Consider the function  $f(x) = 2 \cos(x - 180^\circ) + 3$ .
- Determine the amplitude, period, phase shift, and vertical translation with respect to  $y = \cos x$ .
  - What are the maximum and minimum values of the function?
  - Determine the first  $x$ -intercept to the left of the origin.
  - Determine the  $y$ -intercept of the function.

7. Consider the function

$$f(x) = 0.5 \sin[3(x + 360^\circ)] - 1.$$

- Determine the amplitude, period, phase shift, and vertical translation with respect to  $y = \sin x$ .
- What are the maximum and minimum values of the function?
- Determine the  $y$ -intercept of the function.

**Angles From Trigonometric Ratios**

8. Use a calculator to find the measure of each angle  $x$ , to the nearest tenth of a degree.

a)  $\cos x = 0.5341$               b)  $\sin x = 0.7415$   
 c)  $\tan x = 1.3924$               d)  $\cot x = 0.3651$

9. Use a calculator to find the measure of each angle  $x$ , to the nearest hundredth of a radian.

a)  $\sin x = 0.6954$               b)  $\tan x = 2.3576$   
 c)  $\sec x = 3.7531$               d)  $\csc x = 1.9428$

**Vertical and Horizontal Asymptotes**

10. Consider the reciprocal function

$$y = \frac{1}{x^2 - 2x - 3}.$$

- Determine the equation of the vertical asymptotes.
- Determine the equation of the horizontal asymptotes.
- Graph the function. Use dotted lines to indicate the asymptotes.

**Rates of Change**

11. The temperature on a certain day in December is given by

$$T = -0.1h^2 + 3h - 15, \text{ where } T \text{ is the temperature, in degrees Celsius, at time } h, \text{ in hours, from 12:00 midnight, } 0 \leq h \leq 24.$$

- What is the average rate of change of temperature with respect to time from 8:00 A.M. to 2:00 P.M.?
- Estimate the instantaneous rate of change of the temperature at  $h = 12$  h, to one decimal place.