

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.