

Chapter 5 Test

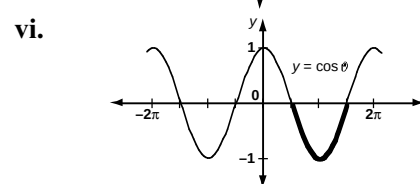
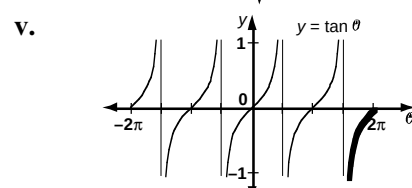
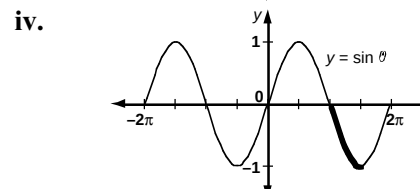
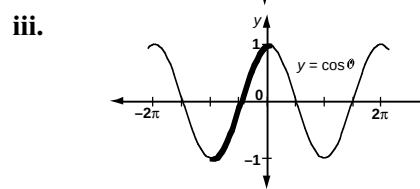
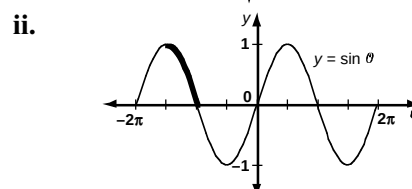
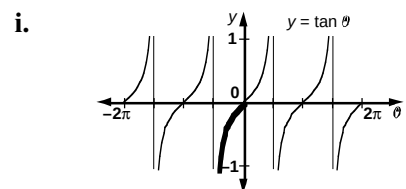
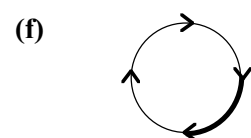
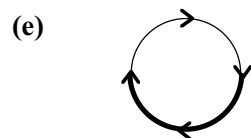
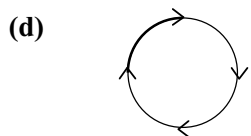
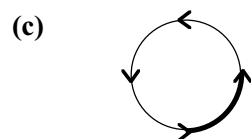
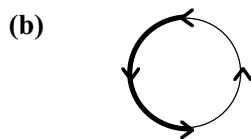
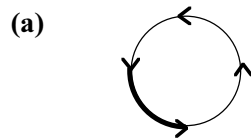
1. Communication

Explain whether each situation is an example of periodic phenomena or not.

- (a) the phases of the moon
- (b) A ball is dropped, bounces, and comes to rest.
- (c) the location of the sun at sunrise each morning

2. Knowledge and Understanding

Point $P(x, y)$ is on the terminal arm of angle θ in standard position. This point could be anywhere on the thicker arc of each unit circle as shown. Match each unit circle to its most likely graph.



3. Application

Point $P(-7, -11)$ is on the terminal arm of angle θ in standard position. Convert $P(-7, -11)$ to the ordered pair $P(r \cos \theta, r \sin \theta)$. Round r to one decimal and θ to the nearest degree.

4. Knowledge and Understanding

- (a) Convert $\frac{-7\pi}{4}$ to degrees.
- (b) Convert 150° to radians.

5. Application

Sketch the graph of $y = \cos 2\theta$, $-\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{2}$.

6. Knowledge and Understanding

- (a) Solve $\tan \theta = \frac{1}{\sqrt{3}}$ for $0^\circ \leq \theta \leq 360^\circ$.
- (b) Solve $\cos x = -0.875$ for $-2\pi \leq x \leq 2\pi$. Round your answers to one decimal.
- (c) Determine the zeros of $7 = 8 + 4 \sin (2\theta)$ for $0^\circ \leq \theta \leq 360^\circ$. Round your answers to the nearest tenth of a degree.

7. Application

Determine the simplest cosine function that represents the following data.

θ	-60°	-30°	0°	30°	60°	90°	120°
y	-2	0	2	0	-2	0	2

8. Thinking, Inquiry, Problem Solving

The average monthly temperature, T , in degrees Celsius, for any month, t , for the town of Someplace, is modelled by the function $T(t) = 19.1 \sin\left(\frac{\pi t}{6} + 4.2\right) + 7.5$. For $t = 0$, the month is January.

- (a) What is the maximum average monthly temperature?
- (b) What is the period of the function and what does it mean?
- (c) What is the phase shift of the function?
- (d) Explain how the graph of the function is a transformation of the graph of the base curve $y = \sin t$.
- (e) When is the average monthly temperature about -8°C ?