

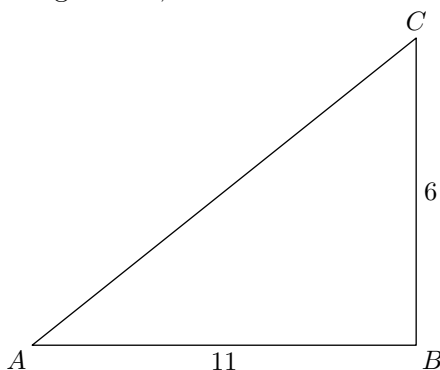
College of the Redwoods
Mathematics Department

Trigonometry— Math 25
Exam #4A

Multiple Choice Questions

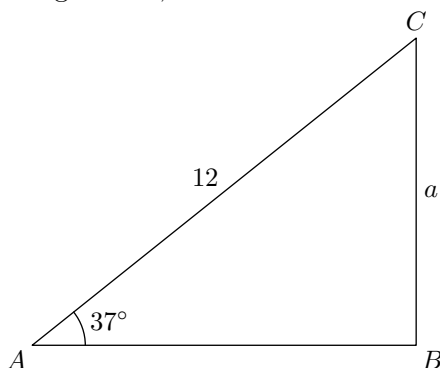
Instructions: For each of the following questions, select the “best” answer and darken the corresponding oval on your scantron. Good luck!

1. In right triangle $\triangle ABC$, right angle at B ,



what is the approximate measure of angle A ?

- (a) 33° (b) 61.3° (c) 28.6° (d) 52.9° (e) 42.3°
2. In right triangle $\triangle ABC$, right angle at B ,



what is the approximate measure of side a ?

- (a) 9.5 (b) 7.2 (c) 9.0 (d) 15.9 (e) 11.3
3. Change 100° to radians.
 (a) $5\pi/9$ rad (b) $4\pi/9$ rad (c) $18000/\pi$ rad (d) $9\pi/20$ rad (e) $5\pi/18$ rad
4. Change $11\pi/15$ radians to degrees.
 (a) 112° (b) 118° (c) 128° (d) 132° (e) 140°
5. A ferris wheel makes 1 revolution every 2 minutes. Find the angular speed of the ferris wheel in radians per second.
 (a) $\pi/60$ rad/s (b) $\pi/80$ rad/s (c) $\pi/12$ rad/s (d) π rad/s (e) $\pi/18$ rad/s
6. If the ferris wheel of exercise 5 has radius 20 feet, what is the speed of a rider on its circumference in feet per second?
 (a) $\pi/4$ ft/s (b) $\pi/2$ ft/s (c) $\pi/3$ ft/s (d) $5\pi/12$ ft/s (e) $5\pi/6$ ft/s
7. What is the amplitude of the sinusoid $y = -4\sin(2x - \pi)$?
 (a) -4 (b) 2 (c) 4 (d) $1/2$ (e) -2

8. What is the period of the sinusoid $y = -3 \cos(2\pi x + \pi)$?
- (a) π (b) 2π (c) $\pi/2$ (d) 2 (e) 1
9. $\cos 5\theta \cos \theta + \sin 5\theta \sin \theta$ equals
- (a) $\cos 6\theta$ (b) $\sin 6\theta$ (c) $\cos 4\theta$ (d) $-\sin 4\theta$ (e) $\sin 4\theta$
10. $2 \sin^2 \theta - 1$ equals
- (a) $\tan 2\theta$ (b) $-\sin 2\theta$ (c) $\sin 2\theta$ (d) $-\cos 2\theta$ (e) $\cos 2\theta$
11. $\frac{1 + \cos 2x}{2}$ equals
- (a) $\cos^2 4x$ (b) $\cos^2 x$ (c) $\sin^2 x$ (d) $\sin^2 2x$ (e) $\cos x$
12. $\sin(-2\theta)$ equals
- (a) $-\cos 2\theta$ (b) $\cos 2\theta$ (c) $-\tan 2\theta$ (d) $\sin 2\theta$ (e) $-\sin 2\theta$
13. $\cos 3\theta + \cos 5\theta$ equals
- (a) $2 \cos 4\theta \sin \theta$ (b) $2 \sin 4\theta \cos \theta$ (c) $2 \cos 4\theta \cos \theta$ (d) $2 \sin 4\theta \sin \theta$ (e) $2 \cos 3\theta \cos 5\theta$

Instructions. Please place the solution of each of the following questions on graph paper. You must show all supporting work to receive credit for your solution.

EXERCISE 1. Given that $\tan x = -3$, $-\pi/2 < x < 0$, evaluate each of the remaining trigonometric functions of x . That is, find $\sin x$, $\cos x$, $\cot x$, $\sec x$, and $\csc x$. Include a carefully labeled diagram (no triangles) that enables you to find each of the required trigonometric functions of x .

EXERCISE 2. Sketch one period of each of the following trigonometric functions. In each case, indicate the scale on each axis.

(a) $y = -2 \sin(2x - \pi)$

(b) $y = -\tan \frac{1}{2}x$

(c) $y = \csc(x + \pi/2)$

EXERCISE 3. Given that $\sin x = -1/4$, $\pi < x < 3\pi/2$, evaluate $\sin 2x$. Include a carefully labeled diagram (no triangles).

EXERCISE 4. Use the appropriate half-angle identity to evaluate $\cos 3\pi/8$. Place your final answer in simple radical form.

EXERCISE 5. Prove the following identity:

$$\cot s + \tan s = \sec s \csc s$$

EXERCISE 6. Prove the following identity:

$$\frac{\sin 2\theta}{1 + \cos 2\theta} = \tan \theta$$