SM3 6.3 Evaluate Six Trig Functions

Problems :   Evaluate the trigonometric expressions of degree measurements:

1) $\sin(45°)$ 2) $\cos(45°)$ 3) $\sec(45°)$ 4) $\csc(45°)$ 5) $\tan(45°)$ 6) $\cot(45°)$

$\dfrac{\sqrt{2}}{2}$ $\dfrac{\sqrt{2}}{2}$ $\sqrt{2}$ $\sqrt{2}$ 1 1

7) $\sin(120°)$ 8) $\cos(120°)$ 9) $\sec(120°)$ 10) $\csc(120°)$ 11) $\tan(120°)$ 12) $\cot(120°)$

$\dfrac{\sqrt{3}}{2}$ $-\dfrac{1}{2}$ -2 $\dfrac{2\sqrt{3}}{3}$ $-\sqrt{3}$ $-\dfrac{\sqrt{3}}{3}$

13) $\sin(90°)$ 14) $\cos(90°)$ 15) $\sec(90°)$ 16) $\csc(90°)$ 17) $\tan(90°)$ 18) $\cot(90°)$

1 0 *undefined* 1 *undefined* 0

19) $\sin(225°)$ 20) $\cos(135°)$ 21) $\sec(300°)$ 22) $\csc(120°)$ 23) $\tan(240°)$ 24) $\cot(330°)$

$-\dfrac{\sqrt{2}}{2}$ $-\dfrac{\sqrt{2}}{2}$ 2 $\dfrac{2\sqrt{3}}{3}$ $\sqrt{3}$ $-\sqrt{3}$

25) $\sin(450°)$ 26) $\cos(-90°)$ 27) $\sec(-30°)$ 28) $\csc(600°)$ 29) $\tan 150°$ 30) $\cot(750°)$

1 0 $\dfrac{2\sqrt{3}}{3}$ $-\dfrac{2\sqrt{3}}{3}$ $-\dfrac{\sqrt{3}}{3}$ $\sqrt{3}$

Evaluate the trigonometric expressions of radian measurements:

31) $\sin\left(\dfrac{\pi}{6}\right)$ 32) $\cos\left(\dfrac{\pi}{6}\right)$ 33) $\sec\left(\dfrac{\pi}{6}\right)$ 34) $\csc\left(\dfrac{\pi}{6}\right)$ 35) $\tan\left(\dfrac{\pi}{6}\right)$ 36) $\cot\left(\dfrac{\pi}{6}\right)$

$\dfrac{1}{2}$ $\dfrac{\sqrt{3}}{2}$ $\dfrac{2\sqrt{3}}{3}$ 2 $\dfrac{\sqrt{3}}{3}$ $\sqrt{3}$

37) $\sin\left(\dfrac{2\pi}{3}\right)$ 38) $\cos\left(\dfrac{4\pi}{3}\right)$ 39) $\sec\left(\dfrac{3\pi}{4}\right)$ 40) $\csc\left(\dfrac{7\pi}{6}\right)$ 41) $\tan\left(\dfrac{11\pi}{6}\right)$ 42) $\cot\left(\dfrac{5\pi}{4}\right)$

$\dfrac{\sqrt{3}}{2}$ $-\dfrac{1}{2}$ $-\sqrt{2}$ -2 $-\dfrac{\sqrt{3}}{3}$ 1

43) $\sin(\pi)$ 44) $\cos\left(\dfrac{\pi}{2}\right)$ 45) $\sec\left(\dfrac{\pi}{2}\right)$ 46) $\csc\left(\dfrac{\pi}{2}\right)$ 47) $\tan\left(\dfrac{\pi}{2}\right)$ 48) $\cot(\pi)$

0 0 *undefined* 1 *undefined*   *undefined*

49) $\sin\left(\dfrac{13\pi}{6}\right)$ 50) $\cos\left(-\dfrac{14\pi}{3}\right)$ 51) $\sec\left(\dfrac{61\pi}{6}\right)$ 52) $\csc\left(-\dfrac{5\pi}{6}\right)$ 53) $\tan\left(-\dfrac{31\pi}{6}\right)$ 54) $\cot\left(\dfrac{17\pi}{2}\right)$

$\dfrac{1}{2}$ $-\dfrac{1}{2}$ $\dfrac{2\sqrt{3}}{3}$ -2 $-\dfrac{\sqrt{3}}{3}$ 0

A secondary math 3 class takes a hiking trip and walks due east into along a trail. Nate, Mitch, and Lincoln fail to pay enough attention to the trail and begin to deviate from the proper course by 30 degrees north of east. After an hour, the class has hiked one mile.
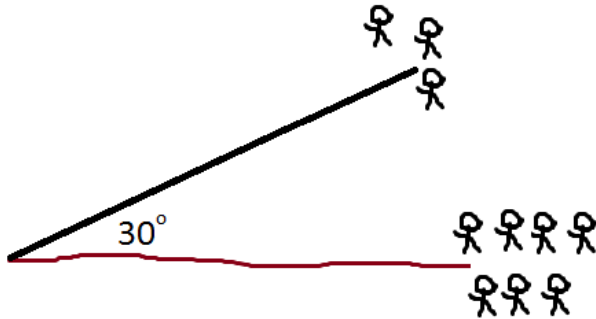
55) Are the wayward students directly north of the main group of students?
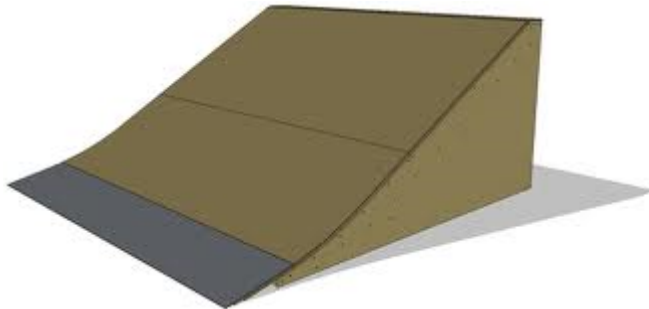No

56) Why or why not?
They've walked a mile and "spent" some of their distance vertically, so they have less distance horizontally.

57) About how far north of the trail are the wayward students?
Half of a mile.

Beth purchases a skate board ramp with a cool innovation: adjustable angle of elevation. The ramp has a ramp length of 1 meter.

58) Not wanting to break her legs on the first approach, Beth sets her ramp's angle of elevation to a mere 30°. How far off of the ground is Beth's skateboard when it leaves the ramp?

$$\frac{1}{2}\,m = 0.5\,m$$

59) How high would the skateboard be if the ramp were set to 45°?

$$\frac{\sqrt{2}}{2}\,m \approx 0.7071\,m$$

60) How high would the skateboard be if the ramp were set to 60°?

$$\frac{\sqrt{3}}{2}\,m \approx 0.8660\,m$$

61) How high would the skateboard be if the ramp were set to 90°?
Trick question; Beth is on the floor with the skateboard because she ran into a wall.