

1. Which one of the following triples could possibly represent three sides of a right triangle?

a) (1, 2, 3)

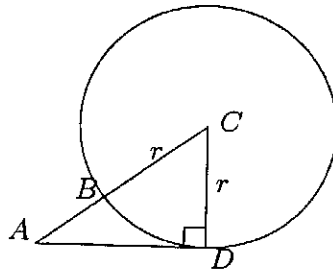
b) (2, 3, 4)

c) (3, 4, 5)

d) (4, 5, 6)

e) (5, 6, 7)

2. Find  $r$  if  $AB = 4$  and  $AD = 8$ .



a) 6

b) 8

c)  $\sqrt{6}$

d) 4

e)  $2\sqrt{2}$

3. In the rectangular coordinate system, which point is farthest from the origin?

- a)  $(1, \sqrt{3})$
- b)  $(\sqrt{2}, \sqrt{2})$
- c)  $(\sqrt{8}, 1)$
- d)  $(\sqrt{2}, \sqrt{7})$
- e)  $(1, \sqrt{15})$

4. Find  $\sin \theta$  if  $\theta$  is in QI and  $\tan \theta = \frac{3}{4}$ .

- a)  $\frac{3}{5}$
- b)  $\frac{4}{5}$
- c)  $\frac{5}{3}$
- d)  $\frac{5}{4}$
- e)  $\frac{4}{3}$

5. Find  $\csc \theta$  if  $\sin \theta > 0$  and  $\cot \theta = -2$ .

- a)  $\frac{1}{\sqrt{5}}$
- b)  $\sqrt{5}$
- c)  $-\frac{2}{\sqrt{5}}$
- d)  $-\frac{\sqrt{5}}{2}$
- e)  $-\frac{1}{2}$

6. Find  $\theta$ , if  $0^\circ < \theta < 360^\circ$  and  $\sec \theta = -2$  with  $\theta$  in QII.

- a)  $60^\circ$
- b)  $120^\circ$
- c)  $135^\circ$
- d)  $150^\circ$
- e)  $240^\circ$

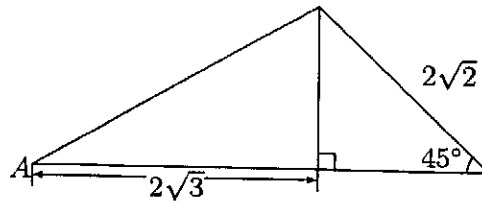
7. Simplify  $\tan \theta + \cot \theta$ .

- a)  $\sec \theta \cdot \csc \theta$
- b)  $\sin \theta \cdot \csc \theta$
- c)  $\sin \theta \cdot \cos \theta$
- d)  $\tan \theta \cdot \cot \theta$
- e)  $\sec \theta \cdot \cos \theta$

8. Find  $\sec 45^\circ$ .

- a)  $\frac{1}{\sqrt{2}}$
- b)  $-\sqrt{2}$
- c)  $\sqrt{2}$
- d)  $\frac{\sqrt{3}}{2}$
- e)  $\frac{2}{\sqrt{3}}$

9. Use the information given in the diagram below to find  $\angle A$ .



- a)  $90^\circ$   
b)  $60^\circ$   
c)  $45^\circ$   
d)  $30^\circ$   
e)  $20^\circ$
10. Suppose there is an escalator that lifts people a vertical distance of 100 feet, while making an angle of  $30^\circ$  with the ground floor. Find the length of this escalator (in *ft*).
- a) 200  
b) 50  
c)  $100\sqrt{3}$   
d)  $100\sqrt{2}$   
e)  $\frac{100}{\sqrt{3}}$

11. Find the exact value of  $\cot 210^\circ$ .

a)  $\frac{1}{2}$

b)  $-\frac{\sqrt{3}}{3}$

c)  $\frac{\sqrt{3}}{3}$

d)  $\sqrt{3}$

e)  $-\sqrt{3}$

12. Find  $\theta$  if  $0^\circ < \theta < 360^\circ$ ,  $\sin \theta = -\frac{\sqrt{3}}{2}$  and  $\theta$  is in QIV.

a)  $-30^\circ$

b)  $-60^\circ$

c)  $300^\circ$

d)  $315^\circ$

e)  $330^\circ$

13. Find the degree measure of  $\frac{5\pi}{12}$ .

a)  $45^\circ$

b)  $75^\circ$

c)  $80^\circ$

d)  $150^\circ$

e)  $180^\circ$

14. Find  $\sin\left(-\frac{3\pi}{4}\right)$ .

a)  $\frac{\sqrt{2}}{2}$

b)  $-\frac{\sqrt{2}}{2}$

c)  $\frac{\sqrt{3}}{2}$

d)  $\frac{2}{\sqrt{3}}$

e)  $\frac{1}{2}$

15. Find all values of  $\theta$  between 0 and  $2\pi$  for which  $\cos \theta = -\frac{1}{2}$ .

a)  $\frac{\pi}{3}, \frac{2\pi}{3}$

b)  $\frac{\pi}{3}, \frac{4\pi}{3}$

c)  $\frac{2\pi}{3}, \frac{4\pi}{3}$

d)  $\frac{2\pi}{3}, \frac{5\pi}{3}$

e)  $\frac{\pi}{3}, \frac{5\pi}{3}$

16. A sector of area  $\frac{\pi}{2}$  is formed by a central angle of  $45^\circ$ , what is the radius of the circle ?

a) 2

b)  $\sqrt{2}$

c)  $\frac{1}{\sqrt{45}}$

d)  $\frac{1}{\sqrt{90}}$

e) 3

17. Find the angular velocity associated with  $33\frac{1}{3}$  rpm .

a)  $\frac{100\pi}{3}$  rad/min

b)  $\frac{200\pi}{3}$  rad/min

c) 200 rad/min

d)  $100\pi$  rad/min

e)  $\frac{100}{3}$  rad/min

18. Find the diagonal of a square whose sides are equal to 2 .

a)  $\sqrt{2}$

b)  $2\sqrt{2}$

c) 4

d)  $4\sqrt{2}$

e) 1

19. A right triangle  $\triangle ABC$  has  $\angle C = 90^\circ$ ,  $b = 5$ ,  $c = 13$ . Find  $\sin A$ .

a)  $\frac{5}{13}$

b)  $\frac{13}{5}$

c)  $\frac{12}{13}$

d)  $\frac{13}{12}$

e)  $\frac{5}{12}$

20. Indicate the quadrant in which the terminal side of  $\theta$  must lie to guarantee that  $\sin \theta < 0$  and  $\csc \theta > 0$ .

a) QI

b) QII

c) QIII

d) QIV

e) None of the above

Key: CAEAB BACDA DCBBC ABBCE