

SAT Math Level 2 Practice Paper 10

SET 1

1. The exact value of  $\tan(-60^\circ)$  is

A.  $-\sqrt{3}$

B.  $-1$

C.  $-\frac{2}{\sqrt{3}}$

D.  $-\frac{\sqrt{3}}{2}$

E.  $-\frac{1}{\sqrt{3}}$

2. The exact value of  $\cos \frac{3\pi}{4}$  is

A.  $-1$

B.  $-\frac{\sqrt{3}}{2}$

C.  $-\frac{\sqrt{2}}{2}$

D.  $-\frac{1}{2}$

E.  $0$

3.  $\csc 540^\circ$  is

A.  $0$

B.  $-\sqrt{3}$

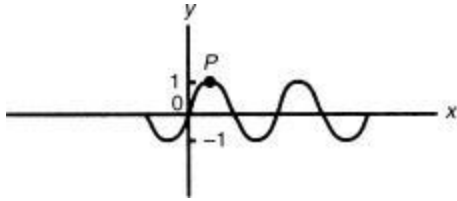
C.  $-\sqrt{2}$

D.  $-1$

E. undefined

SET 2

1. In the figure, part of the graph of  $y = \sin 2x$  is shown. What are the coordinates of point  $P$ ?



A.  $\left(\frac{\pi}{2}, 1\right)$

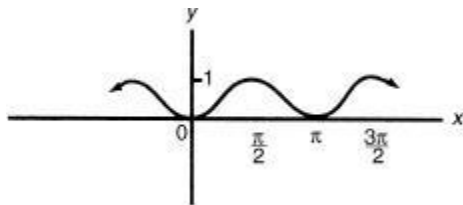
B.  $(\pi, 1)$

C.  $\left(\frac{\pi}{4}, 1\right)$

D.  $\left(\frac{\pi}{2}, 2\right)$

E.  $(\pi, 2)$

2. The figure below could be a portion of the graph whose equation is



A.  $y - 1 = \sin x \cdot \cos x$

B.  $y \sec x = 1$

C.  $2y + 1 = \sin 2x$

D.  $2y + 1 = \cos 2x$

E.  $1 - 2y = \cos 2x$

3. As  $\theta$  increases from  $\frac{\pi}{4}$  to  $\frac{5\pi}{4}$ , the value of  $4\cos\frac{1}{2}\theta$

A. increases, and then decreases

B. decreases, and then increases

C. decreases throughout

D. increases throughout

E. decreases, increases, and then decreases again

4. The function  $f(x) = \sqrt{3} \cos x + \sin x$  has an amplitude of

- A. 1.37
- B. 1.73
- C. 2
- D. 2.73
- E. 3.46

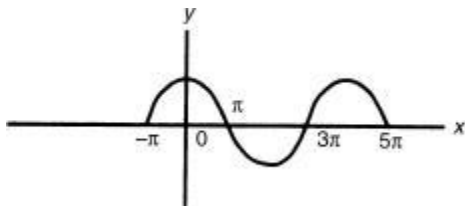
5. For what value of  $P$  is the period of the function  $y = \frac{1}{3} \cos Px$  equal to  $\frac{2\pi}{3}$ ?

- A.  $\frac{1}{3}$
- B.  $\frac{2}{3}$
- C. 2
- D. 3
- E. 6

6. If  $0 \leq x \leq \frac{\pi}{2}$ , what is the maximum value of the function  $f(x) = \sin \frac{1}{3}x$ ?

- A. 0
- B.  $\frac{1}{3}$
- C.  $\frac{1}{2}$
- D.  $\frac{\sqrt{3}}{2}$
- E. 1

7. If the graph in the figure below has an equation of the form  $y = \sin (Mx + N)$ , what is the value of  $N$ ?



- A.  $-\pi$

B. -1

C.  $-\frac{1}{2}$

D.  $\frac{\pi}{2}$

E.  $\pi$

SET 3

1. If  $\sin x = \frac{2}{3}$  and  $\cos x = -\frac{5}{9}$ , find the value of  $\sin 2x$ .

A.  $-\frac{20}{27}$

B.  $-\frac{10}{27}$

C.  $\frac{10}{27}$

D.  $\frac{20}{27}$

E.  $\frac{4}{3}$

2. If  $\tan A = \cot B$ , then

A.  $A = B$

B.  $A = 90^\circ + B$

C.  $B = 90^\circ + A$

D.  $A + B = 90^\circ$

E.  $A + B = 180^\circ$

3. If  $\cos x = \frac{\sqrt{3}}{2}$ , find  $\cos 2x$ .

A. -0.87

B. -0.25

C. 0

D. 0.5

E. 0.75

4. If  $\sin 37^\circ = z$ , express  $\sin 74^\circ$  in terms of  $z$ .

A.  $2z\sqrt{1-z^2}$

B.  $2z^2 + 1$

C.  $2z$

D.  $2z^2 - 1$

E.  $\frac{z}{\sqrt{1-z^2}}$

5. If  $\sin x = -0.6427$ , what is  $\csc x$ ?

A. -1.64

B. -1.56

C. 0.64

D. 1.56

E. 1.7

6. For what value(s) of  $x$ ,  $0 < x < \frac{\pi}{2}$ , is  $\sin x < \cos x$ ?

A.  $x < 0.79$

B.  $x < 0.52$

C.  $0.52 < x < 0.79$

D.  $x > 0.52$

E.  $x > 0.79$

7. What is the range of the function  $f(x) = 5 - 6\sin(\pi x + 1)$ ?

A.  $[-6, 6]$

B.  $[-5, 5]$

C.  $[-1, 1]$

D.  $[-1, 11]$

E.  $[-11, 1]$

SET 4

1. Find the number of degrees in  $\sin^{-1} \frac{\sqrt{2}}{2}$ .

- A. -45
- B. -22.5
- C. 0
- D. 22.5
- E. 45

2. Find the number of radians in  $\cos^{-1}(-0.5624)$ .

- A. -0.97
- B. 0.97
- C. 1.77
- D. 2.16
- E. none of these

3. Evaluate  $\tan^{-1}(\tan 128^\circ)$ .

- A.  $-128^\circ$
- B.  $-52^\circ$
- C.  $52^\circ$
- D.  $128^\circ$
- E. none of these

4. Find the number of radians in  $\cot^{-1}(-5.2418)$ .

- A. -10.8
- B. -5.3
- C. -1.38
- D. -0.19
- E. none of these

5. Which of the following is (are) true?

I.  $\sin^{-1}1 + \sin^{-1}(-1) = 0$

II.  $\cos^{-1}1 + \cos^{-1}(-1) = 0$

III.  $\cos^{-1}x = \cos^{-1}(-x)$  for all  $x$  in the domain of  $\cos^{-1}$

- A. only I

- B. only II
- C. only III
- D. only I and II
- E. only II and III

6. Which of the following is a solution of  $\cos 3x = \frac{1}{2}$ ?

A.  $60^\circ$

B.  $\frac{5\pi}{3}$

C.  $\cos^{-1}\left(\frac{1}{6}\right)$

D.  $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right)$

E.  $\frac{1}{3}\cos^{-1}\left(\frac{1}{2}\right)$

#### SET 5

1. In  $\triangle ABC$ ,  $\angle A = 30^\circ$ ,  $b = 8$ , and  $a = 4\sqrt{2}$ . Angle C could equal

A.  $45^\circ$

B.  $135^\circ$

C.  $60^\circ$

D.  $15^\circ$

E.  $90^\circ$

2. In  $\triangle ABC$ ,  $\angle A = 30^\circ$ ,  $a = 6$ , and  $c = 8$ . Which of the following must be true?

A.  $0^\circ < \angle C < 90^\circ$

B.  $90^\circ < \angle C < 180^\circ$

C.  $45^\circ < \angle C < 135^\circ$

D.  $0^\circ < \angle C < 45^\circ$  or  $90^\circ < \angle C < 135^\circ$

E.  $0^\circ < \angle C < 45^\circ$  or  $135^\circ < \angle C < 180^\circ$

3. The angles of a triangle are in a ratio of 8 : 3 : 1. The ratio of the longest side of the triangle to the next longest side is

A.  $\sqrt{6} : 2$

B. 8:03

C.  $\sqrt{3} : 1$

D. 8:05

E.  $2\sqrt{2} : \sqrt{3}$

4. The sides of a triangle are in a ratio of 4 : 5 : 6. The smallest angle is

A.  $82^\circ$

B.  $69^\circ$

C.  $56^\circ$

D.  $41^\circ$

E.  $27^\circ$

5. Find the length of the longer diagonal of a parallelogram if the sides are 6 inches and 8 inches and the smaller angle is  $60^\circ$ .

A. 8

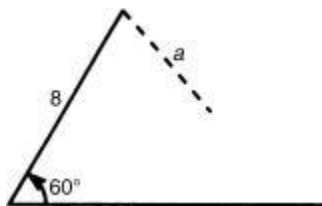
B. 11

C. 12

D. 7

E. 17

6. What are all values of side  $a$  in the figure below such that two triangles can be constructed?



A.  $a > 4\sqrt{3}$

B.  $a > 8$

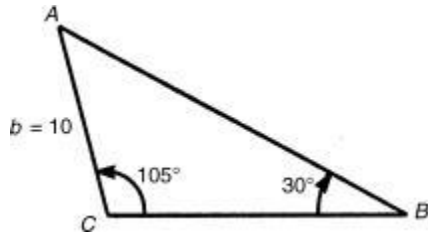
C.  $a = 4\sqrt{3}$

D.  $4\sqrt{3} < a < 8$



E.  $8 < a < 8\sqrt{3}$

7. In  $\triangle ABC$ ,  $\angle B = 30^\circ$ ,  $\angle C = 105^\circ$ , and  $b = 10$ . The length of side  $a$  equals



A. 7

B. 9

C. 10

D. 14

E. 17

8. The area of  $\triangle ABC = 24\sqrt{3}$ , side  $a = 6$ , and side  $b = 16$ . The value of  $\angle C$  is

A.  $30^\circ$

B.  $30^\circ$  or  $150^\circ$

C.  $60^\circ$

D.  $60^\circ$  or  $120^\circ$

E. none of the above

9. The area of  $\triangle ABC = 12\sqrt{3}$ , side  $a = 6$ , and side  $b = 8$ . Side  $c =$

A.  $2\sqrt{37}$

B.  $2\sqrt{13}$

C.  $2\sqrt{37}$  or  $2\sqrt{13}$

D. 10

E. 10 or 12

10. Given the following data, which can form two triangles?

I.  $\angle C = 30^\circ$ ,  $c = 8$ ,  $b = 12$

II.  $\angle B = 45^\circ$ ,  $a = 12\sqrt{2}$ ,  $b = 15\sqrt{2}$

III.  $\angle C = 60^\circ$ ,  $b = 12$ ,  $c = 5\sqrt{3}$

A. only I

B. only II

C. only III

D. only I and II

E. only I and III