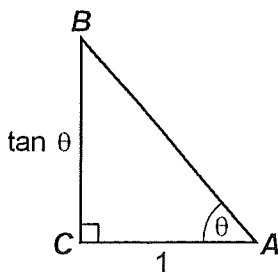


# Third Quarter Test Review

No question on the quarter test will be open ended. Your test will cover all content assigned by the test date.

Name: \_\_\_\_\_

- 1) In right triangle  $\triangle ABC$ ,  $AC = 1$  and  $CB = \tan \theta$ . What is the length of  $AB$ ?



- A)  $1 + \tan \theta$                       B)  $\csc \theta$                       C)  $\tan^2 \theta$                       D)  $\sec \theta$
- 2) If  $\sin \theta = \frac{2}{3}$  and  $\theta$  is in Quadrant I, then what is the value of  $(\tan \theta)(\cos \theta)$ ?
- A)  $\frac{2}{3}$                       B)  $\frac{\sqrt{5}}{3}$                       C)  $\frac{3\sqrt{5}}{5}$                       D)  $\frac{2\sqrt{5}}{3}$
- 3) Express as a whole number:  $(\sin \theta + \cos \theta)^2 + (\sin \theta - \cos \theta)^2$
- A) 1                      B) 2                      C) 3                      D) -1
- 4) Simplify:  $\frac{\cos \theta}{1 - \sin \theta}$
- A)  $\sec \theta + \csc \theta$                       B)  $\sec \theta + \tan \theta$                       C)  $\sec \theta + \cot \theta$                       D)  $\csc \theta + \tan \theta$
- 5) Simplify:  $\frac{1}{1 - \sin \theta} - \frac{1}{1 + \sin \theta}$
- A)  $2 \tan \theta \sec \theta$                       B)  $\tan \theta \sec \theta$                       C)  $2 \cot \theta \sec \theta$                       D)  $\frac{1}{2} \cot \theta \sec \theta$
- 6) What is the expression  $\cot^2 \theta \sin^2 \theta + \cos^2 \theta$  written in simplest form?
- A)  $\cot^2 \theta$                       B)  $\cos^4 \theta$                       C)  $\sin^2 \theta$                       D)  $2 \cos^2 \theta$
- 7) What is the expression  $\sin^2 \theta + \sec^2 \theta + \tan^2 \theta + \cos^2 \theta$  written in simplest form?
- A)  $\frac{1 + \sin^2 \theta}{\cos^2 \theta}$                       B)  $2 \sec^2 \theta$                       C)  $\cos^2 \theta$                       D)  $2 \tan^2 \theta$
- 8) How would the expression  $(1 + \csc \alpha)(1 - \sin \alpha)$  be written in simplest form?
- A)  $\cot \alpha \cos \alpha$                       B)  $\cos \alpha$                       C)  $\csc^2 \alpha$                       D)  $\tan \alpha \cos \alpha$
- 9) How would the expression  $\frac{\sin \theta}{1 - \sin^2 \theta}$  be written in simplest form?
- A)  $\csc \theta \cot \theta$                       B)  $\sec \theta \cot \theta$                       C)  $\csc \theta \tan \theta$                       D)  $\sec \theta \tan \theta$
- 10) Which of the following is a simplified form of  $\frac{2 \sin x}{\sin 2x}$ ?
- A)  $\cos^2 x$                       B)  $\cos x$                       C)  $2 \csc x$                       D)  $\sec x$
- 11) The simplest form of the expression  $(\sin x - \cos x)^2$  is
- A)  $-\cos 2x$                       B)  $1 - \sin 2x$                       C)  $-\sin 2x$                       D) 1
- 12) The simplest form of the expression  $\frac{2 \cot x}{\cos^2 x + \sin^2 x + \cot^2 x}$  is
- A)  $2 \cot x$                       B)  $2 \sin x$                       C)  $\tan 2x$                       D)  $\sin 2x$

- 13) The expression  $\frac{\sin^2 B}{\cos B} + \cos B$  is equivalent to  
 A)  $\frac{1}{\cos B}$                       B) 1                      C)  $\sin^2 B$                       D)  $\frac{1}{\sec B}$
- 14) How many solutions exist for the equation  $3 \cos 2x = -3$  in the interval  $0 \leq x < 2\pi$ ?  
 A) 1                      B) 2                      C) 3                      D) 4
- 15) A solution of the equation  $\sqrt{4 \sin x + 7} = 3$  is  
 A)  $\frac{\pi}{2}$                       B)  $\frac{\pi}{4}$                       C)  $\frac{\pi}{6}$                       D)  $\frac{\pi}{3}$
- 16) Solve for *all* values of  $2 \cos \theta - \sqrt{3} = 0$  when  $0^\circ \leq \theta \leq 360^\circ$ .  
 A)  $30^\circ, 330^\circ$                       B)  $30^\circ, 150^\circ$                       C)  $150^\circ, 210^\circ$                       D)  $210^\circ, 330^\circ$
- 17) What is the solution set of  $\frac{1}{4 \cos \theta} - 2 = \frac{5}{\cos \theta} + 11$  to the nearest degree for the interval  $0 \leq \theta < 360^\circ$ ?  
 A)  $111^\circ, 249^\circ$                       B)  $69^\circ, 111^\circ$                       C)  $69^\circ, 249^\circ$                       D)  $69^\circ, 152^\circ$
- 18) What is the total number of solutions for the equation  $3 \tan^2 A + \tan A - 2 = 0$  in the interval  $0 \leq A \leq \pi$ ?  
 A) 1                      B) 2                      C) 3                      D) 4
- 19) What is a value of  $\theta$  that satisfies the equation  $(\sin \theta + \cos \theta)^2 = 2$ ?  
 A)  $\frac{\pi}{3}$                       B)  $\frac{\pi}{4}$                       C)  $\frac{\pi}{2}$                       D) 0
- 20) For which value of  $x$  is  $f(x) = \frac{\sin x}{\cos x}$  undefined?  
 A)  $\pi$                       B)  $\frac{\pi}{4}$                       C) 0                      D)  $\frac{\pi}{2}$
- 21) In  $\triangle ABC$ , if  $a = 4$ ,  $b = 6$ , and  $\sin A = \frac{3}{5}$ , then  $\sin B$  equals  
 A)  $\frac{3}{20}$                       B)  $\frac{9}{10}$                       C)  $\frac{6}{10}$                       D)  $\frac{8}{10}$
- 22) In  $\triangle ABC$ ,  $\sin A = \frac{1}{2}$  and  $\sin B = \frac{1}{2}\sqrt{2}$ . What is the value of  $\frac{b}{a}$ ?  
 A) 2                      B)  $\frac{1}{2}$                       C)  $\frac{1}{2}\sqrt{2}$                       D)  $\sqrt{2}$
- 23) In  $\triangle ABC$ ,  $a = 19$ ,  $c = 10$ , and  $m\angle A = 111^\circ$ . Which statement can be used to find the value of  $\angle C$ ?  
 A)  $\sin C = \frac{10 \sin 69^\circ}{19}$                       B)  $\sin C = \frac{19 \sin 69^\circ}{10}$                       C)  $\sin C = \frac{10}{19}$                       D)  $\sin C = \frac{10 \sin 21^\circ}{19}$
- 24) In  $\triangle ABC$ ,  $m\angle A = 45^\circ$ ,  $m\angle B = 30^\circ$ , and side  $a = 10$ . What is the length of side  $b$ ?  
 A)  $10\sqrt{2}$                       B)  $10\sqrt{3}$                       C)  $5\sqrt{2}$                       D)  $5\sqrt{3}$
- 25) Which expression is equivalent to  $\sin 22^\circ \cos 18^\circ + \cos 22^\circ \sin 18^\circ$ ?  
 A)  $\cos 40^\circ$                       B)  $\cos 4^\circ$                       C)  $\sin 40^\circ$                       D)  $\sin 4^\circ$
- 26) The expression  $2 \cos \left( \frac{\pi}{6} - x \right)$  is equivalent to  
 A)  $\cos x + \sqrt{3} \sin x$                       B)  $\sqrt{3} \cos x - \sin x$                       C)  $\cos x - \sqrt{3} \sin x$                       D)  $\sqrt{3} \cos x + \sin x$
- 27) What is  $\tan(x - \pi) - \tan(x + \pi)$  reduced to simplest form?  
 A)  $\tan 2x$                       B)  $2 \tan 2x$                       C) -1                      D) 0
- 28) If  $\tan x = 2$ , what is the value of  $\tan \left( \frac{\pi}{4} - x \right)$ ?  
 A)  $-\frac{1}{3}$                       B)  $\frac{1}{3}$                       C)  $\frac{1}{2}$                       D)  $-\frac{1}{2}$

- 29) If  $\angle A$  and  $\angle B$  are acute angles,  $\sin A = \frac{4}{5}$ , and  $\cos B = \frac{5}{13}$ , what is the value of  $\sin(A + B)$ ?
- A)  $\frac{63}{65}$                       B)  $\frac{56}{65}$                       C)  $\frac{46}{65}$                       D)  $\frac{16}{65}$
- 30) If  $\sin a = \frac{12}{13}$ ,  $\cos b = \frac{3}{5}$ , and  $a$  and  $b$  are acute angles, the value of  $\cos(a - b)$  is
- A)  $-\frac{33}{65}$                       B)  $-\frac{14}{65}$                       C)  $\frac{63}{65}$                       D)  $\frac{21}{65}$
- 31) If  $\sin 75^\circ = \sin(30^\circ + 45^\circ)$ , then  $\sin 75^\circ$  equals
- A)  $\frac{\sqrt{2} + \sqrt{6}}{4}$                       B)  $\frac{\sqrt{6} - \sqrt{2}}{4}$                       C)  $\frac{-\sqrt{2} - \sqrt{6}}{4}$                       D)  $\frac{-\sqrt{6} + \sqrt{2}}{4}$
- 32) For which value of  $x$  is  $f(x)$  undefined if  $f(x) = \frac{\cos x}{1 - \cos 2x}$ ?
- A)  $\pi$                       B) 1                      C)  $\frac{1}{2}$                       D)  $\frac{\pi}{2}$
- 33) For all values of  $A$  for which the expressions are defined,  $\frac{\sin 2A}{\cos A} - \sin A$  is equivalent to
- A)  $\sin A$                       B)  $\cos A$                       C) 1                      D)  $2 \sin A$
- 34) In  $\triangle ABC$ ,  $a = 6$ ,  $b = 12$ , and  $m\angle C = 60^\circ$ . What is the length of side  $c$  to the nearest integer?
- A) 5                      B) 11                      C) 10                      D) 20
- 35) In  $\triangle ABC$ ,  $a = 4$ ,  $b = 3$ , and  $c = 3$ . What is the value of  $\cos A$ ?
- A)  $-\frac{1}{9}$                       B)  $\frac{1}{18}$                       C)  $-\frac{1}{18}$                       D)  $\frac{1}{9}$
- 36) In  $\triangle ABC$ , side  $a$  is twice as long as side  $b$  and  $m\angle C = 30^\circ$ . In terms of  $b$ , the area of  $\triangle ABC$  is
- A)  $0.25b^2$                       B)  $0.5b^2$                       C)  $b^2$                       D)  $0.866b^2$
- 37) What is the area of  $\triangle ABC$  if  $a = 8$ ,  $b = 6$ , and  $\sin C = 0.75$ ?
- A) 72                      B) 36                      C) 18                      D) 9
- 38) What is the area of parallelogram  $ABCD$  given  $AB = 24$ ,  $BC = 20$ , and  $\sin B = \frac{3}{8}$ ?
- A) 150                      B) 90                      C) 1,280                      D) 180
- 39) The vertex angle of isosceles triangle  $ABC$  measures  $30^\circ$ , and each leg has length 20. What is the area of  $\triangle ABC$ ?
- A) 200                      B)  $100\sqrt{2}$                       C)  $100\sqrt{3}$                       D) 100
- 40) A garden in the shape of an equilateral triangle has sides whose lengths are 10 meters. What is the area of the garden?
- A)  $50 \text{ m}^2$                       B)  $50\sqrt{3} \text{ m}^2$                       C)  $25 \text{ m}^2$                       D)  $25\sqrt{3} \text{ m}^2$
- 41) What is a value of  $\theta$  that satisfies the equation  $2 \sin^2 \theta - 5 \sin \theta - 3 = 0$ ?
- A)  $150^\circ$                       B)  $30^\circ$                       C)  $210^\circ$                       D)  $300^\circ$
- 42) What are *all* values of  $\theta$  in the interval  $180^\circ < \theta < 360^\circ$  that satisfy the equation  $4 \sin^2 \theta - 1 = 0$ ?
- A)  $210^\circ, 240^\circ$                       B)  $210^\circ, 300^\circ$                       C)  $210^\circ, 330^\circ$                       D)  $194^\circ, 346^\circ$
- 43) If  $y$  is in quadrant *II* and  $\cos y = -\frac{1}{\sqrt{3}}$ , find  $\tan 2y$ .
- 44) If  $\tan B = a + b$ , what is  $\tan 2B$  in terms of  $a$  and  $b$ ?

- 45) If  $A$  is a positive acute angle and  $\cos A = \frac{1}{3}$ , find the value of  $\cos \frac{A}{2}$ .
- 46) If  $A$  is a positive acute angle and  $\cos A = \frac{5}{13}$ , find the value of  $\sin 2A$ .
- 47) What is the exact value of  $\frac{2 \tan 15^\circ}{1 - \tan^2 15^\circ}$ ?
- 48) Use a half-angle formula to find the exact value of  $\cos 15^\circ$ .
- 49) If  $A$  is a positive acute angle and  $\sin A = \frac{\sqrt{5}}{3}$ , what is  $\cos 2A$ ?
- A)  $\frac{1}{3}$                                       B)  $-\frac{1}{9}$                                       C)  $\frac{1}{9}$                                       D)  $-\frac{1}{3}$
- 50) If  $x$  is a positive acute angle and  $\sin x = \frac{1}{2}$ , what is  $\sin 2x$ ?
- A)  $\frac{\sqrt{3}}{2}$                                       B)  $\frac{1}{2}$                                       C)  $-\frac{\sqrt{3}}{2}$                                       D)  $-\frac{1}{2}$
- 51) If  $\cos x = 0.8$ , what is a value of  $\tan \frac{1}{2}x$ ?
- A) 3    B)  $\frac{1}{9}$     C) 9    D)  $\frac{1}{3}$
- 52) The expression  $1 - 2 \sin^2 45^\circ$  has the same value as
- A)  $\sin 22\frac{1}{2}^\circ$                                       B)  $\cos 45^\circ$                                       C)  $\sin 90^\circ$                                       D)  $\cos 90^\circ$
- 53) The expression  $2 \sin^2 \theta + \cos (2\theta)$  has the same value as
- A) 1    B) 2    C)  $\sin^2 \theta$                                       D)  $-\sin^2 \theta$
- 54) The expression  $\cos 2A - \cos^2 A$  is equivalent to
- A)  $\cos^2 A$                                       B)  $\sin^2 A - 1$                                       C)  $\cos^2 A + 1$                                       D)  $-\sin^2 A$
- 55) The expression  $\sin A \cos A + \sin 2A$  is equivalent to
- A)  $\cos A + 2 \sin 2A$                                       C)  $\cos A + 2 \sin A$   
 B)  $\sin A (\cos A + \sin A)$                                       D)  $3 \sin A \cos A$
- 56) In the interval  $0^\circ \leq \theta \leq 360^\circ$ ,  $\sin \theta = \cos \theta$  when  $\theta$  is
- A)  $45^\circ$  and  $225^\circ$                                       B)  $225^\circ$ , only                                      C)  $45^\circ$ , only                                      D)  $135^\circ$  and  $315^\circ$
- 57) What is the solution, in terms of  $\pi$ , of the equation  $\sin 2\theta - \cos^2 \theta + 1 = \sin^2 \theta + \sin \theta$ , in the interval  $0 \leq \theta < 2\pi$ ?
- A)  $0, \frac{\pi}{3}, \pi, \frac{5\pi}{3}$                                       B)  $\frac{3\pi}{4}, \frac{11\pi}{6}, \frac{5\pi}{4}$                                       C)  $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$                                       D)  $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$
- 58) In terms of  $\pi$ , what is the solution to  $\sin^2 x - 3 \cos^2 x = 0$ , where  $0 \leq x < 2\pi$ ?
- A)  $\frac{\pi}{3}$ , only                                      B)  $\frac{\pi}{4}$ , only                                      C)  $\frac{\pi}{3}, \frac{4\pi}{3}$                                       D)  $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$