GRADE 11 ADVANCED (2020 -21)

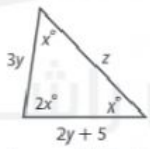
Revision Worksheet - ***Chapter 3 and 4 (TRIGONOMETRY)***

State whether each sentence is *true* or *false*.

1. The sine of an acute angle in a right triangle is the ratio of the lengths of its opposite leg to the hypotenuse.
2. The secant ratio is the reciprocal of the sine ratio.
3. The rate at which an object moves along a circular path is called its linear speed.
4. $0°$, π, and $-\frac{\pi}{2}$ are examples of reference angles.
5. The period of the graph of $y = 4 \sin 3x$ is 4.
6. For $f(x) = \cos bx$, as b increases, the frequency decreases.

The range of the arcsine function is $[0, \pi]$.

Q1 In the figure, what is the value of z?



Note: Figure not drawn to scale.

A 15
B $15\sqrt{2}$
C $15\sqrt{3}$
D $30\sqrt{2}$
E $30\sqrt{3}$

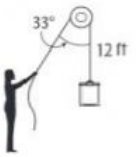
Q2 A kite is being flown at a 45° angle. The string of the kite is 120 ft long. How high is the kite above the point at which the string is held?

F 60 ft
G $60\sqrt{2}$ ft
H $60\sqrt{3}$ ft
J 120 ft

Q3 Mowmed uses a ladder to reach a window 3 m above the ground. If the ladder is 0.9 m away from the wall, how long should the ladder be?

F 2.86 m
G 3.2 m
H 3.4 m
J 3.7 m

Q4 A person holds one end of a rope that runs through a pulley and has a weight attached to the other end. Assume that the weight is at the same height as the person's hand. What is the distance from the person's hand to the weight?



A 7.8 ft
B 10.5 ft
C 12.9 ft
D 14.3 ft

Q5 If $\sec\theta = \frac{25}{7}$ and θ is acute, then $\sin\theta =$

A $\frac{7}{25}$

B $\frac{24}{25}$

C $-\frac{24}{25}$

D $\frac{25}{7}$

Q6 Which of the following radian measures is equal to 56°?

F $\frac{\pi}{15}$

G $\frac{7\pi}{45}$

H $\frac{14\pi}{45}$

J $\frac{\pi}{3}$

Q7 Suppose θ is an angle in standard position with $\sin\theta > 0$. In which quadrant(s) could the terminal side of θ lie?

A I only

B I and II

C I and III

D I and IV

Q8 Which angle has a tangent and cosine that are both negative?

A 110°

B 180°

C 210°

D 340°

Q9 Find the angular speed in radians per second of a point on a bicycle tire if it completes 2 revolutions in 3 seconds.

F $\frac{\pi}{3}$

G $\frac{\pi}{2}$

H $\frac{2\pi}{3}$

J $\frac{4\pi}{3}$

Q10 If $\cos\theta = \frac{8}{17}$ and the terminal side of the angle is in Quadrant IV, what is the exact value of $\sin\theta$?

F $-\frac{15}{8}$

G $-\frac{17}{15}$

H $-\frac{15}{17}$

J $-\frac{8}{15}$

Q11 Identify the equation represented by the graph.

A $y = \frac{1}{2}\sin 4x$

B $y = \frac{1}{4}\sin 2x$

C $y = 2\sin 2x$

D $y = 4\sin\frac{1}{2}x$

Q12 If $\tan x = \frac{10}{24}$ in the figure below, what are $\sin x$ and $\cos x$?

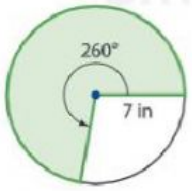
F $\sin x = \frac{26}{10}$ and $\cos x = \frac{24}{26}$

G $\sin x = \frac{10}{26}$ and $\cos x = \frac{24}{26}$

H $\sin x = \frac{26}{10}$ and $\cos x = \frac{26}{24}$

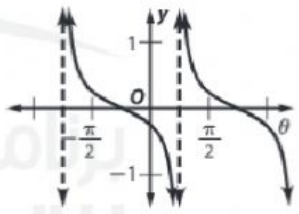
J $\sin x = \frac{10}{26}$ and $\cos x = \frac{26}{24}$

Q13 Find the approximate area of the shaded region.



A $12.2\ \text{in}^2$
B $42.8\ \text{in}^2$
C $85.5\ \text{in}^2$
D $111.2\ \text{in}^2$

Q14 Which equation is represented by the graph?



A $y = \cot\left(\theta + \frac{\pi}{4}\right)$
B $y = \cot\left(\theta - \frac{\pi}{4}\right)$
C $y = \tan\left(\theta + \frac{\pi}{4}\right)$
D $y = \tan\left(\theta - \frac{\pi}{4}\right)$

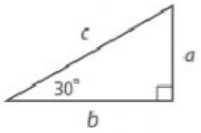
Q15 Which of the functions has the same graph as $y = 3\sin(x - \pi)$?

F $y = 3\sin(x + \pi)$
G $y = 3\cos\left(x - \frac{\pi}{2}\right)$
H $y = -3\sin(x - \pi)$
J $y = -3\cos\left(x + \frac{\pi}{2}\right)$

Q16 If $\sin\theta = -\frac{1}{2}$ and $\pi < \theta < \frac{3\pi}{2}$, then $\theta = ?$

F $\frac{13\pi}{12}$
G $\frac{7\pi}{6}$
H $\frac{5\pi}{4}$
J $\frac{4\pi}{3}$

Q17 Refer to the figure below. If $c = 14$, find the value of b.



F $\frac{\sqrt{3}}{2}$
G $14\sqrt{3}$
H 7
J $7\sqrt{3}$

Q18 **SAT/ACT** If $x + y = 90°$ and x and y are both nonnegative angles, what is equal to $\frac{\cos x}{\sin y}$?

A 0
B $\frac{1}{2}$
C 1
D 1.5
E Cannot be determined from the information given.

Q19 Which of the following represents the exact value of $\sin\left(\tan^{-1}\frac{1}{2}\right)$?

F $-\frac{2\sqrt{5}}{5}$
G $-\frac{\sqrt{5}}{5}$
H $\frac{\sqrt{5}}{5}$
J $\frac{2\sqrt{5}}{5}$

Q20 The hypotenuse of a right triangle is 67 cm. If one of the angles has a measure of 47°, what is the length of the shortest leg of the triangle?

A 45.7 cm
B 49.0 cm
C 62.5 cm
D 71.8 cm

Q21 What is the linear speed of a point rotating at an angular speed of 36 radians per second at a distance of 12 cm from the center of the rotation?

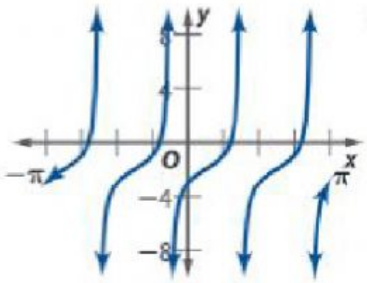
A 420 cm/s
B 432 cm/s
C 439 cm/s
D 444 cm/s

Q22 An angle θ satisfies the following inequalities: $\csc\theta < 0$, $\cot\theta > 0$, and $\sec\theta < 0$. In which quadrant does θ lie?

F I
G II
H III
J IV

Match each function with its graph. Write the letters a, b, c or d against the correct

a.



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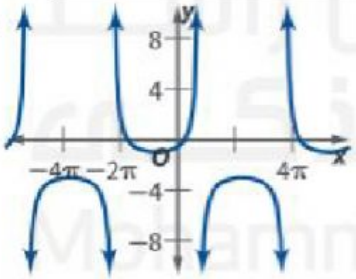
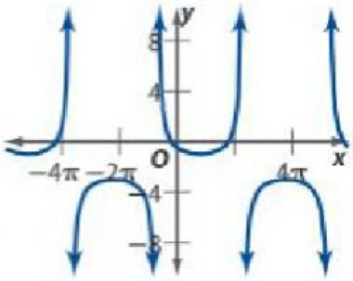
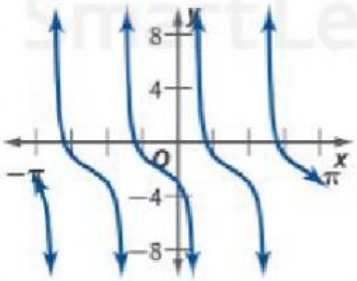


c.



d.



$y = \csc\left(\frac{x}{3} + \frac{\pi}{4}\right) - 2$

$y = \sec\left(\frac{x}{3} + \frac{\pi}{4}\right) - 2$

$y = \cot\left(2x - \frac{\pi}{4}\right) - 2$

$y = \tan\left(2x - \frac{\pi}{4}\right) - 2$

Insert the trigonometric function that completes each identity.

3. $\cos x =$ _____ $\left(x - \frac{3\pi}{2}\right)$

4. $\cot x =$ _____ $(x + 90°)$

5. $\sec x =$ _____ $(x - 180°)$

6. $\csc x =$ _____ $\left(x + \frac{\pi}{2}\right)$

Q23

Which identity is true?

F $\cos(\theta + \pi) = -\sin\pi$

G $\cos(\pi - \theta) = \cos\theta$

H $\sin\left(\theta - \frac{3\pi}{2}\right) = \cos\theta$

J $\sin(\pi + \theta) = \sin\theta$

Q24

Which expression is *not* true?

A $\tan(-\theta) = -\tan\theta$

B $\tan(-\theta) = \frac{1}{\cot(-\theta)}$

C $\tan(-\theta) = \frac{\sin(-\theta)}{\cos(-\theta)}$

D $\tan(-\theta) + 1 = \sec(-\theta)$

Q25 If $\sin x = m$ and $0 < x < 90°$, then $\tan x =$

F $\frac{1}{m^2}$

G $\frac{1-m^2}{m}$

H $\frac{m\sqrt{1-m^2}}{1-m^2}$

J $\frac{m}{1-m^2}$

Q26 Which of the following is equivalent to $\frac{1-\sin^2\theta}{1-\cos^2\theta} \cdot \tan\theta$?

A $\tan\theta$

B $\cot\theta$

C $\sin\theta$

D $\cos\theta$

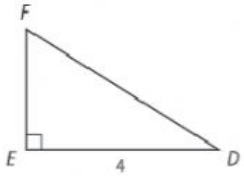
Q27 Refer to the figure. If $\cos D = 0.8$, what is the length of $\overline{DF}$?

F 5

G 4

H 3.2

J $\frac{4}{5}$



Q28 Which of the following is not equivalent to $\cos\theta$ when $0 < \theta < \frac{\pi}{2}$?

A $\frac{\cos\theta}{\cos^2\theta + \sin^2\theta}$

B $\frac{1-\sin^2\theta}{\cos\theta}$

C $\cot\theta \sin\theta$

D $\tan\theta \csc\theta$

Q29 Which expression can be used to form an identity with $\frac{\sec\theta + \csc\theta}{1+\tan\theta}$ when $\tan\theta \neq -1$?

F $\sin\theta$

G $\cos\theta$

H $\tan\theta$

J $\csc\theta$

Q30 Which of the following is equivalent to $\sin\theta + \cot\theta\cos\theta$?

F $2\sin\theta$

G $\frac{1}{\sin\theta}$

H $\cos^2\theta$

J $\frac{\sin\theta + \cos\theta}{\sin^2\theta}$

Q31 If $\cos x = -0.45$, what is $\sin\left(x - \frac{\pi}{2}\right)$?

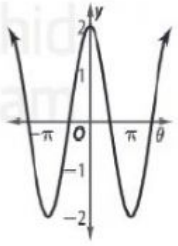
F -0.55

G -0.45

H 0.45

J 0.55

Q32 The graph of $y = 2\cos\theta$ is shown. Which is a solution for $2\cos\theta = 1$?



F $\frac{8\pi}{3}$

G $\frac{10\pi}{3}$

H $\frac{13\pi}{3}$

J $\frac{15\pi}{3}$

Q33 Which of the following is *not* a solution of $0 = \sin\theta + \cos\theta\tan^2\theta$?

A $\frac{3\pi}{4}$

B $\frac{7\pi}{4}$

C 2π

D $\frac{5\pi}{2}$

Q34 Which of the following is the solution set for $\cos\theta\tan\theta - \sin^2\theta = 0$?

F $\frac{\pi}{2}n$, where n is an integer

G $\frac{\pi}{2} + n\pi$, where n is an integer

H $\pi + 2n\pi$, where n is an integer

J $n\pi$, where n is an integer

Q35 Which of the following is equivalent to $\frac{\cos\theta(\cot^2\theta + 1)}{\csc\theta}$?

F $\tan\theta$

G $\cot\theta$

H $\sec\theta$

J $\csc\theta$

Q36 Which of the following is not equal to $\csc\theta$?

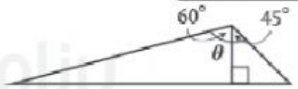
A $\sec(90° - \theta)$

B $\sqrt{\cot^2\theta + 1}$

C $\frac{1}{\sin\theta}$

D $\frac{1}{\sin(90° - \theta)}$

Q37 Find the exact value of $\sin\theta$.



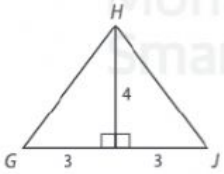
A $\frac{\sqrt{2} + \sqrt{6}}{4}$

B $\frac{\sqrt{2} - \sqrt{6}}{4}$

C $\frac{2 + \sqrt{3}}{4}$

D $\frac{2 - \sqrt{3}}{4}$

Q38 Refer to the figure below. Which equation could be used to find $m\angle G$?



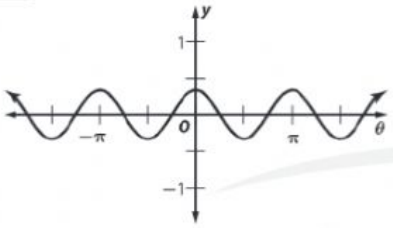
F $\sin G = \frac{3}{4}$

G $\cos G = \frac{3}{4}$

H $\cot G = \frac{3}{4}$

I $\tan G = \frac{3}{4}$

Q39 Identify the equation for the graph.



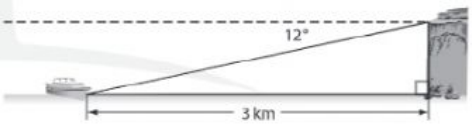
A $y = 3\cos 2\theta$

B $y = \frac{1}{3}\cos 2\theta$

C $y = 3\cos\frac{1}{2}\theta$

D $y = \frac{1}{3}\cos\frac{1}{2}\theta$

Q40 From a lookout point on a cliff above a lake, the angle of depression to a boat on the water is 12°. The boat is 3 km from the shore just below the cliff. What is the height of the cliff from the surface of the water to the lookout point?



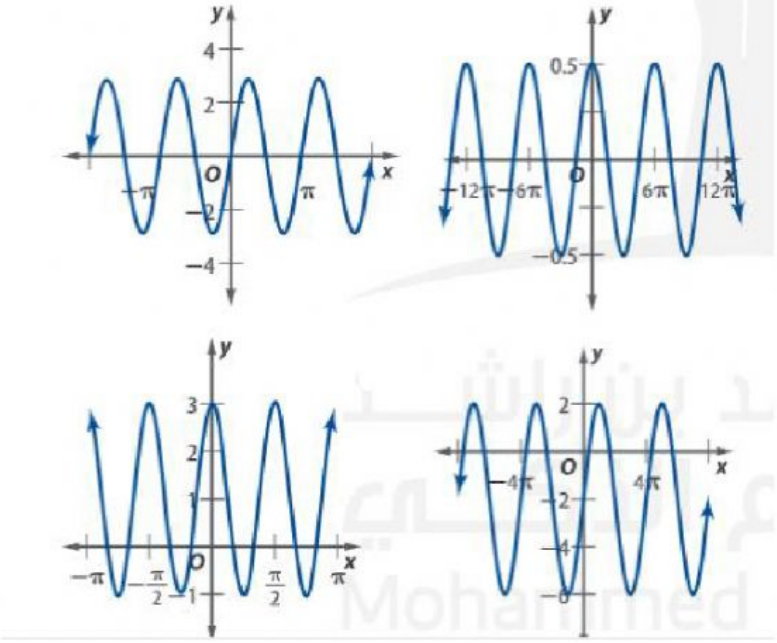
F $\frac{3}{\sin 12°}$

G $\frac{3}{\tan 12°}$

H $\frac{3}{\cos 12°}$

J $3\tan 12°$

Write an equation that corresponds to each graph.



A. $y = 2\cos 4x + 1$

B. $y = 3\sin 2x$

C. $y = 4\sin\frac{x}{2} - 2$

D. $y = \frac{1}{2}\cos\frac{x}{3}$

Complete each identity by filling in the blank.

1. $\sec\theta = $ _____

2. _____ $= \frac{\sin\theta}{\cos\theta}$

3. _____ $+ 1 = \sec^2\theta$

4. $\cos(90° - \theta) = $ _____

5. $\tan(-\theta) = $ _____

6. $\sin(\alpha + \beta) = \sin\alpha$ _____ $+ \cos\alpha$ _____

7. _____ $= \cos^2\alpha - \sin^2\alpha$

8. _____ $= \pm\sqrt{\frac{1+\cos\theta}{2}}$

9. $\frac{1-\cos 2\theta}{2} = $ _____

10. _____ $= \frac{1}{2}[\cos(\alpha - \beta) + \cos(\alpha + \beta)]$

A. $\sin^2\theta$ B. $-\tan\theta$ C. $\tan\theta$ D. $\sin\theta$ E. $\cos\alpha$ F. $\sin\alpha$

G. $\cos\beta$ H. $\sin\beta$ I. $\tan^2\theta$ J. $\cos 2\alpha$ K. $\sin 2\alpha$ L. $1/\cos\theta$

M. $\cot^2\theta$ N. $\cos\alpha . \cos\beta$ O. $\sin\alpha . \sin\beta$ P. $\cos\frac{\theta}{2}$

Q. $\sin\alpha . \cos\beta$ R. $\sin\frac{\theta}{2}$