Pre-Calculus 11 - VLN

Chapter 6: Trigonometry

Lesson 6: Trigonometric Ratios of Any Angle

Question #1: Express Trigonometric Ratios

Reference Q.13259

Point $P(x, y)$ is on the terminal arm of the angle θ in standard position. The distance $OP = r$, where O is the origin. Express the three primary trigonometric ratios in terms of x, y, and r.

Question #2: Calculate The Value Of r

Reference Q.13260

The point $(9, 12)$ lies on the terminal arm of an angle θ as shown. Calculate the value of r, and hence determine the exact values of the primary trigonometric ratios.

Question #3: Determine The Trigonometric Ratios

Reference Q.13262

The point $(5, 4)$ lies on the terminal arm of an angle θ. Determine the exact values of $\sin\theta, \cos\theta,$ and $\tan\theta$. Answer as an exact radical with a rational denominator.

Question #4: Determine The Trigonometric Ratios

Reference Q.13264

The point $(6, 12)$ lies on the terminal arm of an angle θ. Determine the exact values of $\sin\theta, \cos\theta,$ and $\tan\theta$. Answer as a mixed radical in simplest form with a rational denominator.

Question #5: Determine The Exact Value

Reference Q.13279

The point $(4, 6)$ lies on the terminal arm of angle A in standard position. The exact value of $\cos A$ is

A. $\frac{1}{\sqrt{13}}$

B. $\frac{2}{\sqrt{13}}$

C. $\frac{3}{\sqrt{13}}$

D. $\frac{3}{\sqrt{26}}$

Question #6: Finding Exact Values of Trig Ratios

Reference Q.13283

The point $(8, -6)$ lies on the terminal arm of an angle θ in standard position.

Determine the exact values of $\sin\theta, \cos\theta, \text{ and } \tan\theta$

Question #7: Finding Exact Values of Trig Ratios

Reference Q.13284

The point $(-1, -3)$ lies on the terminal arm of an angle θ in standard position.

Determine the exact values of $\sin\theta, \cos\theta, \text{ and } \tan\theta$.

Question #8: Finding Exact Values of Trig Ratios

Reference Q.13285

The point $(-16, 63)$ lies on the terminal arm of an angle A in standard position.

Determine the exact value of $\cos A$.

Question #9: Calculate The Distance From The Origin

Reference Q.13254

Sketch the rotation angle in standard position, and calculate the exact distance from the origin to the given point.

a. Point $P(15, -8)$ on the terminal arm of angle θ.

b. Point $Q(-24, -7)$ on the terminal arm of angle B.

Question #10: Determine The Exact Distance

Reference Q.13257

Determine the exact distance from the origin to each of the following points. Where appropriate, answer in simplest mixed radical form.

a. $(-6, -8)$

b. $(2, 7)$

c. $(-4, 4)$

Question #11: Determine The Correct Quadrant

Reference Q.13266

In which quadrant(s) does the terminal arm of θ lie if:

a. $\sin\theta$ is positive?

b. $\tan\theta$ is positive?

c. $\cos\theta$ is negative?

d. both $\sin\theta$ and $\tan\theta$ are negative?

e. $\cos\theta$ is positive and $\sin\theta$ is negative?

Question #12: Determine Whether Positive Or Negative

Reference Q.13267

Determine, without using technology, whether the given trigonometric ratios are positive or negative.

a. $\cos 310°$

b. $\sin 94°$

c. $\tan 265°$

d. $\sin 288°$

e. $\tan 109°$

f. $\cos 207°$

Question #13: Rewrite As An Acute Angle

Reference Q.13278

Rewrite as the same trigonometric function of a positive acute angle.

a. $\sin 205°$

b. $\tan 193°$

c. $\cos 97°$

d. $\sin 156°$

e. $\cos 321°$

f. $\tan 340°$

Question #14: Determine Which Has A Different Sign

Reference Q.13280

Without using technology, determine which of the following has a different sign from the others.

A. $\tan 255°$
B. $\sin 272°$
C. $\cos 175°$
D. $-\tan 75°$

Question #15: Determine Which Has The Same Value

Reference Q.13281

Without using technology, determine which of the following has the same value as $\cos 297°$.

A. $\cos 27°$
B. $\cos 117°$
C. $-\cos 243°$
D. $-\cos 63°$

Question #16: Finding Exact Values of Trig Ratios

Reference Q.13286

If $\cos\theta = \frac{12}{13}$ and $270° \leq \theta \leq 360°$, then find the exact values of $\sin\theta$ and $\tan\theta$

Question #17: Finding Exact Values of Trig Ratios

Reference Q.13287

If $\sin\theta = -\frac{4}{7}$ and $\cos\theta$ is negative, then find the exact value of $\tan\theta$.

Question #18: Finding Exact Values of Trig Ratios

Reference Q.13288

If $\tan A = -\frac{15}{8}$ and $0° \leq A \leq 180°$, then find the values of $\sin A$ and $\cos A$.

Question #19: Finding Trigonometric Ratios

Reference Q.13360

If $\tan B = 0.8$ and $\cos B$ is negative, then find the exact value of $\sin B$.

Question #20: Finding Trigonometric Ratios

Reference Q.13362

If $\sin X = -\frac{1}{4}$ and $\tan X$ is negative, express $\cos X$ as an exact value.

Question #21: Finding Trigonometric Ratios

Reference Q.13372

Solve for the required ratios in each of the following. Express each answer as an exact value with a rational denominator.

a. Angle θ terminates in the second quadrant. If $\tan\theta = -\frac{\sqrt{3}}{5}$, find $\sin\theta$ and $\cos\theta$

b. Angle θ terminates in the fourth quadrant. If $\tan\theta = -\frac{\sqrt{3}}{5}$, find $\sin\theta$ and $\cos\theta$.

Question #22: Finding Trigonometric Ratios

Reference Q.13380

If $\cos A = -\frac{7}{25}$, and $180° \leq A \leq 270°$, then the values of $\sin A$ and $\tan A$ respectively are

A. $-\frac{24}{25}$ and $-\frac{24}{7}$
B. $-\frac{24}{25}$ and $\frac{24}{7}$
C. $-\frac{24}{25}$ and $\frac{7}{24}$
D. $\frac{24}{25}$ and $\frac{24}{7}$

Question #23

Reference Q.13308

If $\cos A = \frac{\sqrt{3}}{2}$, and angle A is not a first quadrant angle, determine the exact value of $\tan A$.

Question #24: Finding Trigonometric Ratios

Reference Q.13381

If $\sin\theta = -\frac{1}{2}$, and $270° \leq \theta \leq 360°$, then the value of $\cos\theta$ is

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

Question #25: Finding Trigonometric Ratios

Reference Q.13382

Angle P has a terminal arm in third quadrant. If $\tan P = \frac{1}{\sqrt{3}}$, the value of $\sin P - \cos P$ is

A. $\frac{1-\sqrt{3}}{2}$

B. $\frac{\sqrt{3}-1}{2}$

C. $\frac{1+\sqrt{3}}{2}$

D. $\frac{-1-\sqrt{3}}{2}$

Question #26: Finding Trigonometric Ratios

Reference Q.13377

Find the measure of θ, to the nearest degree, where $0° \leq \theta \leq 360°$.

a. $\sin\theta = 0.6485$

b. $\cos\theta = -0.8219$

c. $\tan\theta = 0.4668$

d. $6\sin\theta = -1$

e. $4\cos\theta - 3 = 0$

f. $\tan\theta + 5 = 0$

Question #27: Consider Three Angles

Reference Q.13282

Consider angles A, B, and C such that $\cos A = \cos 217°, \tan B = \tan 298°$, and $\sin C = \sin 7°$, where $0° \leq A \leq 360°, 0° \leq B \leq 360°$, and $0° \leq C \leq 360°$. If $A \neq 217, B \neq 298$, and $C \neq 7$, what is the value of $A + B + C$