Math 3 Name: KEY

Unit 1.2 Trigonometric Functions PRACTICE

Find the trigonometry function values of the most commonly used angles. $0°, 90°, 180°, 270°$, and $360°$

1)

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$	$\csc\theta$	$\sec\theta$	$\cot\theta$
$0°$	0	1	0	undefined	1	undefined
$90°$	1	0	undefined	1	undefined	0
$180°$	0	-1	0	undefined	-1	undefined
$270°$	-1	0	undefined	-1	undefined	0
$360°$	0	1	0	undefined	1	undefined

Use the trigonometric function values from the above table to evaluate each expression.
An expression such as $cot^2\ 90°$ means $(cot\ 90°)^2$.

2) $\cos 90° + 3\sin 270°$ -3

3) $\tan 0° - 6\sin 90°$ -6

4) $3\sec 180° - 5\tan 360°$ -3

5) $4\csc 270° + 3\cos 180°$ -7

6) $\tan 360° + 4\sin 180° + 5cos^2\ 180°$ 5

7) $2\sec 0° + 4\,cot^2\ 90° + \cos 360°$ 3

8) $sin^2\ 180° + cos^2\ 180°$ 1

9) $sin^2\ 360° + cos^2\ 360°$ 1

10) $sec^2\ 180° - 3\,sin^2\ 360° + 2\cos 180°$ -1

11) $5\,sin^2\ 90° + 2\,cos^2\ 270° - 7\tan 360°$ 5

12) **Concept check:** If $\cot\theta$ is undefined, then what is the value of $\tan\theta$?

0

13) **Concept check:** If the terminal side of an angle θ is in quadrant III, then what is the sign of each of the trigonometric function values of θ?

$\tan\theta$ and $\cot\theta$ are positive, all other trig functions are negative.

Suppose that the point (x, y) is in the indicated quadrant. Decide whether the given ratio is positive or negative.

14) II, $\frac{x}{r}$ negative

15) III, $\frac{y}{r}$ negative

16) IV, $\frac{y}{x}$ negative

17) IV, $\frac{x}{y}$ negative

18) II, $\frac{y}{r}$ positive

19) III, $\frac{x}{r}$ negative

20) IV, $\frac{x}{r}$ positive

21) IV, $\frac{y}{r}$ negative

Find the values of the six trigonometric functions for each angle in standard position having the given point on its terminal side. Rationalize denominators when applicable.

22) $(-3, 4)$

$\sin\theta = \frac{4}{5}$

$\cos\theta = \frac{-3}{5}$

$\tan\theta = \frac{4}{-3}$

$\csc\theta = \frac{5}{4}$

$\sec\theta = \frac{5}{-3}$

$\cot\theta = \frac{-3}{4}$

23) $(-4, -3)$

$\sin\theta = \frac{-3}{5}$

$\cos\theta = \frac{-4}{5}$

$\tan\theta = \frac{3}{4}$

$\csc\theta = \frac{5}{-3}$

$\sec\theta = \frac{5}{-4}$

$\cot\theta = \frac{4}{3}$

24) $(0, 2)$

$\sin\theta = 1$

$\cos\theta = 0$

$\tan\theta = undefined$

$\csc\theta = 1$

$\sec\theta = undefined$

$\cot\theta = 0$

25) $(-4, 0)$

$\sin\theta = 0$

$\cos\theta = -1$

$\tan\theta = 0$

$\csc\theta = undefined$

$\sec\theta = -1$

$\cot\theta = undefined$

26) $(1, \sqrt{3})$

$\sin\theta = \frac{\sqrt{3}}{2}$

$\cos\theta = \frac{1}{2}$

$\tan\theta = \sqrt{3}$

$\csc\theta = \frac{2\sqrt{3}}{3}$

$\sec\theta = 2$

$\cot\theta = \frac{\sqrt{3}}{3}$

27) $(-2\sqrt{3}, -2)$

$\sin\theta = \frac{-1}{2}$

$\cos\theta = \frac{-\sqrt{3}}{2}$

$\tan\theta = \frac{\sqrt{3}}{3}$

$\csc\theta = -2$

$\sec\theta = \frac{-2\sqrt{3}}{3}$

$\cot\theta = \sqrt{3}$

28) $(-2, 0)$

$\sin\theta = 0$

$\cos\theta = -1$

$\tan\theta = 0$

$\csc\theta = undefined$

$\sec\theta = -1$

$\cot\theta = undefined$

29) $(3, -4)$

$\sin\theta = \frac{-4}{5}$

$\cos\theta = \frac{3}{5}$

$\tan\theta = \frac{-4}{3}$

$\csc\theta = \frac{-5}{4}$

$\sec\theta = \frac{5}{3}$

$\cot\theta = \frac{-3}{4}$

30) The angles $15°$ and $75°$ are complementary. With your calculator determine $\sin 15°$ and $\cos 75°$. Make a conjecture about the sines and cosines of complementary angles, and test your hypothesis with other pairs of complementary angles.

They are equal

31) The angles $25°$ and $65°$ are complementary. With your calculator determine $\tan 25°$ and $\cot 65°$. Make a conjecture about the tangents and cotangents of complementary angles, and test your hypothesis with other pairs of complementary angles.

They are equal

32) With your calculator determine $\sin 10°$ and $\sin(-10°)$. Make a conjuncture about the sines of an angle and its negative, and test your hypothesis with other angles. Also, use a geometry argument with the definition of $\sin\theta$ to justify your hypothesis.

They are negatives of each other