

Precalculus · Inverse Trigonometric Functions and Trigonometric Equations · Test

Common Core F-TF.B.6, F-TF.B.7 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This precalculus inverse trig test checks inverse trigonometric functions and trigonometric equations in 45 minutes, with 9 questions for a total of 20 points.

This test covers inverse trigonometric functions, restricted domains, and trigonometric equations. It has 9 questions worth 20 points and should take about 45 minutes. A calculator is allowed. Give exact answers in terms of π unless a rounded answer is requested.

Test information

- **Grade:** Precalculus
- **Chapter:** Inverse Trigonometric Functions and Trigonometric Equations
- **Common Core:** F-TF.B.6, F-TF.B.7
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 3 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 2 pts; Question 5: 2 pts; Question 6: 2 pts; Question 7: 2 pts; Question 8: 3 pts; Question 9: 2 pts)

Precalculus Inverse Trig Test: questions 1-5

Question 1: Exact inverse values (3 points)

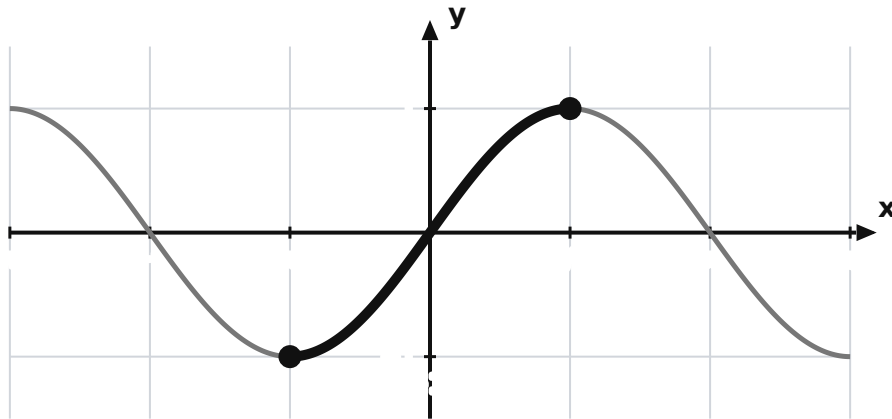
- Evaluate $\sin^{-1}\left(-\frac{\sqrt{2}}{2}\right)$. (1 point)
- Evaluate $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$. (1 point)
- Evaluate $\tan^{-1}(-\sqrt{3})$. (1 point)

Question 2: Compositions (2 points)

- Find $\cos^{-1}\left(\cos\frac{7\pi}{4}\right)$. (1 point)
- Find $\sin^{-1}\left(\sin\frac{4\pi}{3}\right)$. (1 point)

Question 3: Restricted sine (2 points)

The graph shows $y = \sin x$.



Sine graph with the middle piece drawn thick.

- State the interval on which sine is restricted to define $\sin^{-1}x$. (1 point)
- Explain why sine has no inverse function on all real numbers. (1 point)

Question 4: Triangle compositions (2 points)

- Find the exact value of $\sin\left(\cos^{-1}\frac{5}{13}\right)$. (1 point)
- Find the exact value of $\cos\left(\sin^{-1}\left(-\frac{4}{5}\right)\right)$. (1 point)

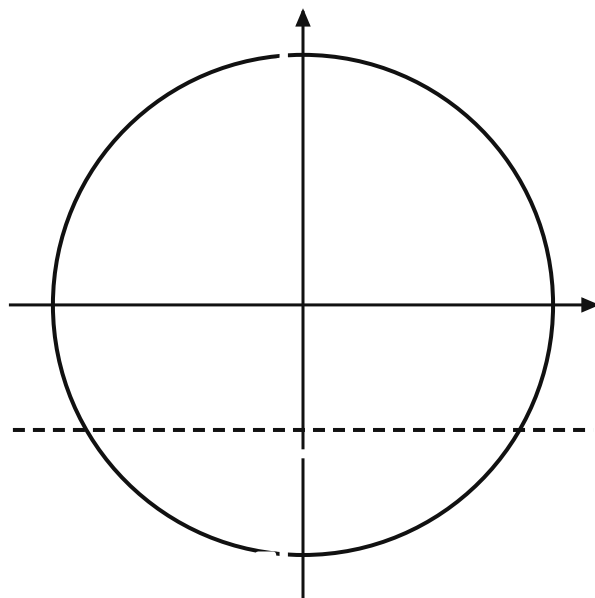
Question 5: Exact equation (2 points)

Solve $2\cos x - \sqrt{3} = 0$ for $0 \leq x < 2\pi$.

Precalculus Inverse Trig Test: questions 6-9

Question 6: Sine on the unit circle (2 points)

The unit circle shows the line $y = -\frac{1}{2}$.



Unit circle with a horizontal line below the x-axis.

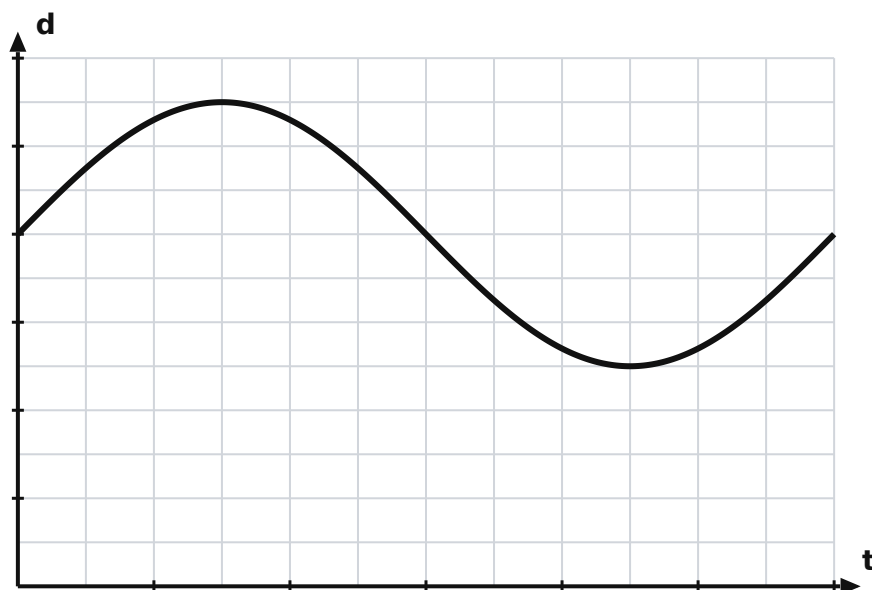
- Find all solutions of $\sin x = -\frac{1}{2}$ for $0 \leq x < 2\pi$. (1 point)
- Write all real solutions. (1 point)

Question 7: Equation by calculator (2 points)

Solve $5\cos x = 2$ for $0 \leq x < 2\pi$. Round each answer to the nearest hundredth.

Question 8: Dock depth (3 points)

The depth of water at a dock is $d(t) = 8 + 3\sin\left(\frac{\pi t}{6}\right)$ feet, where t is the number of hours after 6 a.m., for $0 \leq t \leq 12$.



Graph of the depth for the first twelve hours.

- a. Find all times when the depth is 9.5 ft. (2 points)
- b. Describe when the depth is at least 9.5 ft. (1 point)

Question 9: Quadratic equation (2 points)

Solve $2\sin^2 x + \sin x - 1 = 0$ for $0 \leq x < 2\pi$.

How to use this precalculus inverse trig test

Take this precalculus inverse trig test without notes, then grade it with the test answer key out of 20 points.

