

Graphs of Trigonometric Functions: math test, Grade 12 – download the PDF

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Analyzing a sinusoid

/ 4 pts

Let $y = -2 \sin(3x - \pi) + 1$.

- Rewrite the function in the form $A \sin(B(x - C)) + D$ and give the amplitude and the period.
- Give the phase shift with its direction.
- Give the midline, the maximum and the minimum.
- Compute y at $x = \frac{\pi}{3}$ and at $x = \frac{\pi}{2}$.

2 Writing an equation

/ 4 pts

A cosine function has a maximum value of 12 at $x = 0$ and its next minimum value of 2 at $x = 3$.

- Find its amplitude, midline and period.
- Write its equation.
- Compute $y(1)$ and find all x in $[0, 6]$ with $y = 9.5$.

3 Tangent and cotangent

/ 3 pts

- a. For $y = \tan(3x)$: give the period, the asymptotes nearest the origin, and y at $x = \frac{\pi}{12}$.
- b. For $y = \cot x$: give the asymptotes in $[0, \pi]$, the zero in $(0, \pi)$, and the values at $x = \frac{\pi}{4}$ and $x = \frac{3\pi}{4}$.

4 Cosecant

/ 3 pts

Let $y = 3 \csc x$.

- a. Give the asymptotes and the range.
- b. Compute y at $x = \frac{\pi}{6}$ and at $x = \frac{7\pi}{6}$.
- c. Identify the local extrema on $(0, 2\pi)$.

5 Inverse trigonometric values

/ 3 pts

Evaluate exactly.

- a. $\arcsin \frac{\sqrt{3}}{2}$
- b. $\arccos \frac{\sqrt{2}}{2}$
- c. $\arctan(-\sqrt{3})$
- d. $\cos \left(\arcsin \frac{5}{13} \right)$
- e. $\arcsin \left(\sin \frac{7\pi}{6} \right)$

6

Hours of daylight

/ 3 pts

Calculator allowed. In a northern city, the hours of daylight on day t of the year ($t = 1$ is January 1) are modeled by $D(t) = 12 + 3.5 \sin\left(\frac{2\pi(t - 80)}{365}\right)$.

- Give the maximum and the minimum number of daylight hours, and the period.
- Compute $D(172)$ to the nearest hundredth.
- For about how many days of the year are there at least 14 hours of daylight?

**Test yourself: quick challenge for Grade 12**[Change level](#)Level : **Grade 12**

6 random questions, instant feedback.

**Start the challenge****Keep exploring with Zyro****Test solutions****Math lessons**

Graphs of Trigonometric Functions: math test solutions, Grade 12

Graphs of Trigonometric Functions: math lesson, Grade 12

 **Math practice**

Graphs of Trigonometric Functions: math practice, Grade 12

 **Test solutions**

Trigonometric Identities and Equations: math test solutions, Grade 12

 **Test solutions**

Law of Sines and Law of Cosines: math test solutions, Grade 12

 **Math lessons**

Trigonometric Identities and Equations: math lesson, Grade 12

Zyro takes you to our partner sites

Blast off to other planets of knowledge and their apps.

Lift off