

3. Trigonometric and Polar Functions

Starter Quiz · 课前小测

AP Precalculus

Name: _____ Score: _____

1. A **periodic** function is one that...

- ☐ repeats the same pattern at regular intervals
- ☐ always increases
- ☐ never repeats
- ☐ is a straight line

2. In a right triangle, $\sin \theta$ equals...

- ☐ opposite $\div$ hypotenuse
- ☐ adjacent $\div$ hypotenuse
- ☐ opposite $\div$ adjacent
- ☐ hypotenuse $\div$ opposite

3. What is $\sin 0$?

4. The parent sine graph $y = \sin x$ starts (at $x = 0$) at height...

- ☐ 0, then rises
- ☐ 1, then falls
- ☐ -1, then rises
- ☐ 2, then falls

5. In $y = a \sin(b(x - c)) + d$, the **amplitude** is...

- ☐ $|a|$
- ☐ b
- ☐ d
- ☐ c

6. Increasing $|a|$ in $y = a \sin(bx) + d$ makes the wave...

- ☐ taller (bigger amplitude)
- ☐ faster (shorter period)
- ☐ shift sideways
- ☐ lift its midline

7. The horizontal length of one complete cycle is called the _____.

8. What is $\cos 0$?

9. In $y = a \sin(b(x - c)) + d$, the midline is the line $y =$ _____.

10. The midline of a fitted sinusoid is the _____ of the highest and lowest data values.

1. **repeats the same pattern at regular intervals**

A **periodic** function cycles through the same values again and again — like tides or a spinning wheel.

2. **opposite ÷ hypotenuse**

SOH: **sine** is opposite over hypotenuse. CAH: cosine is adjacent over hypotenuse. TOA: tangent is opposite over adjacent.

3. **0**

At angle 0, the unit-circle point is (1, 0), so the y-coordinate $\sin 0 = 0$.

4. **0, then rises**

Since $\sin 0 = 0$, the sine wave begins at the midline and rises to its peak of 1.

5. **$|a|$**

The coefficient a stretches the wave vertically, so the **amplitude** is $|a|$.

6. **taller (bigger amplitude)**

$|a|$ is the **amplitude**, so a larger $|a|$ stretches the wave taller.

7. **period**

The **period** is how far along the input axis you go before the pattern repeats.

8. **1**

At angle 0, the point is (1, 0), so the x-coordinate $\cos 0 = 1$.

9. **d**

Adding d shifts the whole wave up, so the **midline** sits at $y = d$.

10. **average**

Midline = $\frac{\max + \min}{2}$; the **amplitude** is half the distance between them.