

1. Find the hypotenuse when the legs are 3 and 4.

2. For $r=4$ and $\theta=0.5$ radians, find arc length.

3. Using the small-angle formula, approximate $\sin(0.2 \text{ radians})$.

4. Find $\sec(2\pi/3)$.

5. If $\sec\theta=2$ and θ is acute, find $\tan^2\theta$.

6. Cosine of a sum always equals the sum of the two cosine values.

☐ True ☐ False

7. The amplitude of a $\cos\theta+b \sin\theta$ is always $|a|+|b|$.

☐ True ☐ False

8. Solving $\sin 2x$ on one full turn of $2x$ always finds every x solution on $[0,2\pi)$.

☐ True ☐ False

9. The sine rule pairs each side with any angle in the triangle.

☐ True ☐ False

10. A transformed tangent graph has a finite amplitude and can be joined across its vertical asymptotes.

☐ True ☐ False

1. **5.0**

Pythagoras gives $\sqrt{(3^2+4^2)}=5$.

2. **2.0**

Arc length= $r\theta=4\times0.5=2$.

3. **0.2**

$\sin\theta\approx\theta$, with $\theta=0.2$ radians.

4. **-2.0**

$\cos(2\pi/3)=-1/2$, so its reciprocal is -2 .

5. **3.0**

$\tan^2\theta=\sec^2\theta-1=4-1=3$.

6. **False**

$\sin(A+B)$ is not $\sin A+\sin B$. The cosine rule chord uses the smaller included angle when necessary, but its cosine is still $\cos(A-B)$. Coordinate distance and the resulting identities hold for all signed angles; the initial diagram is one illustrative case. $\tan(45^\circ+45^\circ)$ is undefined because $1-\tan45^\circ\tan45^\circ=0$.

7. **False**

A plain $\arctan(b/a)$ can select the wrong quadrant and fails when $a=0$. Match both sine and cosine coefficients. The amplitude is $\sqrt{(a^2+b^2)}$, not $|a|+|b|$. Do not treat the principal inverse cosine value as the only solution. The angle-mode unit must match the stated interval.

8. **False**

Solving only one cycle of u misses roots. An excluded upper endpoint for x need not be the upper endpoint for u when $k<0$. Dividing by a trig factor can remove zero roots; squaring can introduce extra roots. Substitute into the original equation, whose reciprocal/tangent denominators may still exclude a candidate.

9. **False**

Do not pair a side with its adjacent angle in the sine rule. The area angle must be included. A calculator's first inverse-sine answer need not be the only possible triangle.

10. **False**

The cosine maximum need not occur at $x=0$ after a horizontal shift. For the stated tangent function, draw separate increasing branches between asymptotes. A negative horizontal or vertical factor reverses the direction; never join branches across a break. Vertical translations change outputs but not the period or excluded x values. A displayed interval may contain only part of a complete shifted cycle.