

Name _____

Date _____

Please show ALL of your work if full or partial credit is desired. Communicating your solution is as important as stating your answer.

1. Find the exact value of each of the following (draw pictures):

(a) $\arccos\left(-\frac{1}{2}\right)$.

(b) $\arcsin\left(-\frac{1}{2}\right)$.

(c) $\arctan(-1)$.

2. If $\theta = \frac{5\pi}{4}$, then find the following exactly (draw pictures):

(a) $\arcsin(\sin(\theta)) =$

(b) $\arccos(\cos(\theta)) =$

(c) $\arctan(\tan(\theta)) =$

3. For what angles is the $\arcsin(\sin(\theta)) = \theta$?

4. Find the exact value of each of the following (draw pictures):

(a) $\tan\left(\arccos\left(-\frac{2}{3}\right)\right)$.

(b) $\cos\left(\arctan\left(-\frac{1}{2}\right)\right)$.

(c) $\sin\left(\arccos\left(\frac{2}{9}\right)\right)$.

5. State 10 different trigonometric identities.

6. Simplify: $2\sin^2(0.5\Psi) + 2\cos^2(0.5\Psi)$

7. Graph $y = \arcsin(x)$. Include a table of values with 8 points.

8. Express $\tan\left(\arccos\left(\frac{x}{2}\right)\right)$ in terms of x without trigonometric functions. Draw a triangle.

NOTE: $x \in [-2, 0) \cup (0, 2]$

9. Prove or disprove three of the identities below. Identify which you want graded:

(a) $\sin(\phi) + \cos(\phi) = \sqrt{1}$

(b) $(1 - \cos^2(\theta))^2 + \sin^2(\theta) = 2(1 - \cos(\theta))$

(c) $2\cos(\theta)\sin(\phi) = \sin(\theta + \phi) - \sin(\theta - \phi)$

(d) $\frac{1+\sin(x)}{\cos(x)} = \frac{\cos(x)}{1-\sin(x)}$

(e) $\cos(2\theta) = 2\cos(\theta)$

(f) $\cos^4(\theta) - \cos^2(\theta) = \sin^4(\theta) - \sin^2(\theta)$

(g) $(\cos(\theta) - \sin(\theta))^2 + \sin(2\theta) = 1$

(h) $\frac{2\tan(\theta)}{1+\tan^2(\theta)} = \sin(2\theta)$

10. Find all exact solutions to three of the following equations on the interval $[0, 2\pi)$.

(a) $\cos(2\alpha) = \frac{1}{2}$

(b) $2 \sin^2(\theta) = 1$

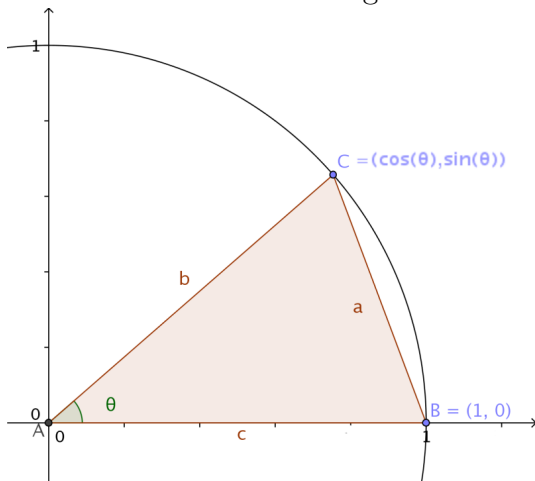
(c) $\sin(2\phi) = 2 \sin(\phi)$

(d) $\sin^2(\psi) + \sin(\psi) - 1 = 0$

11. Find the exact value of the $\cos\left(\frac{\pi}{8}\right)$.

12. Find the exact value of the $\cos\left(\frac{\pi}{16}\right)$.

13. Find a formula for the length of cord a on the unit circle in terms of sine and/or cosine.



14. Each named line segment below represents a different one of the six trigonometric functions. Please identify them.

