

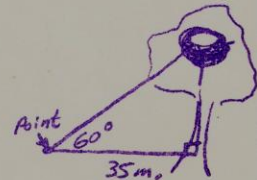
TRIGONOMETRY EXAM 1A

NAME _____

Show all work as necessary on this test or on separate paper.

Calculators are required and trig formula sheets are allowed.
(If not specified round to nearest hundredth.)

1. Express $34^{\circ} 17' 25''$ as a decimal degrees to four decimal places. 1. _____
2. Express 145.278° degrees, minutes, seconds to nearest seconds. 2. _____
3. _____
3. Express $\frac{11\pi}{18}^R$ in $^{\circ}$ (Exact form.) 4. _____
5. _____
4. Express 330° in radians (Exact form.) 6. _____
5. The radius of a circle is 24.3 cm. Find the length of the arc for a central angle of 120° . 7. _____
8. _____
6. Find the velocity of a point on the rim of a wheel of radius 14.8 cm. if it is rotating at 35 rev per minute. (Give answer in meters per second.) 9. _____
10. $\sin \theta =$ _____
 $\sin(90-\theta) =$ _____
7. Give the angular velocity of the hour hand of a clock in radians per hour. 11. _____
8. A circle has a radius 12.3 cm. Find the area of a sector of the circle with central angle 30° .
9. If θ is an angle for which $\sin \theta = \frac{1}{3}$, find $\tan \theta$ in exact form.
10. If $\cos \theta = \frac{8}{17}$, find $\sin \theta$ and $\sin(90^{\circ} - \theta)$ in exact form.
11. The angle from a point on the ground to the top of an eagles nest is 60° . If the point is 35m. from the base of the tree, how high is the nest?



12. Evaluate $\sin 36.3^\circ$ with four place accuracy.

12. _____

13. Evaluate $\tan 13.2^\circ$ with four place accuracy.

13. _____

14. Evaluate: $\frac{5.86 \sin 24^\circ 18' }{\sin 47^\circ 21'}$
 (Answer Nearest hundredth)

14. _____

15. _____

In 15-16, tell what quadrant the angle is in:

16. _____

15. $\frac{16\pi}{3}$ R.

16. 1080°

In 17-18, label the sides of the triangles with proportional values:

19. $\sin \theta =$ _____

17.



18.



$\cos \theta =$ _____

$\tan \theta =$ _____

20. _____

In 19-21, find the exact values:

21. $\cos \theta =$ _____

19. If θ is an angle in standard position and $(-3, 4)$ is on the terminal side of θ . Find $\sin \theta$, $\cos \theta$, and $\tan \theta$.

$\csc \theta =$ _____

22. _____

20. Give exact value of $\sin 240^\circ$.

23. _____

21. If $\sin \theta = -.25$ and $\cos \theta > 0$, find $\cos \theta$ and $\csc \theta$. (Exact value).

24. _____

22. Give the value of $\sin^2 35.6^\circ + \cos^2 35.6^\circ$.

25. _____

In 23-25, derive and simplify formulas (SHOW WORK)

23. $\sin(\alpha + \frac{3\pi}{2})$

24. $\tan(\alpha + \pi)$

25. $\cos(2\pi - \alpha)$

In 26-28, graph for $0 \leq x \leq 2\pi$

26. $y = \cos x$

27. $y = \tan x$

28. $y = \csc x$

TRIG EXAM 1A Solutions

1. 34.2903°

2. $145^\circ 16' 41''$

3. $\frac{11\pi R}{18} \cdot \frac{180^\circ}{\pi R} = 110^\circ$

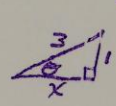
4. $330^\circ \cdot \frac{\pi R}{180^\circ} = \frac{11\pi}{6}$

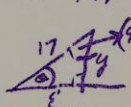
5. $A = r\theta$, θ in Radians.
 $A = (24.3) \left(\frac{2\pi}{3} \right) = 50.89 \text{ cm}$
 $120^\circ \cdot \frac{\pi}{180} = \frac{2\pi}{3}$

6. $r = 14.8 \text{ cm} = .148 \text{ m}$
 $\omega = 35 \frac{\text{Rev}}{\text{min}} \cdot \frac{2\pi R}{1 \text{ Rev}} = 70\pi R/\text{min}$
 $v = r\omega = \frac{.48 \times 70\pi}{60} \text{ m/sec} = .54 \text{ m/s}$

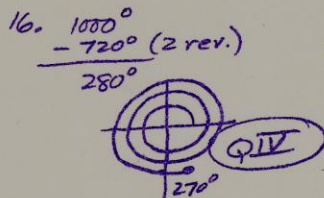
7. $\omega = \frac{1 \text{ Rev}}{12 \text{ hr.}} = \frac{2\pi R}{12 \text{ hr}} = \frac{\pi R}{6 \text{ hr}}$

8. $A = \frac{\theta r^2}{2}$, θ in Radians.
 $30^\circ \cdot \frac{\pi}{180} = \frac{\pi}{6}$
 $A = \frac{\pi}{6} \cdot 12.3^2 = 39.61 \text{ cm}^2$

9. $\sin \theta = \frac{1}{3} = \frac{\text{opp}}{\text{hyp}}$

 $x^2 + 1^2 = 3^2$
 $x^2 = 8$
 $x = \sqrt{8} = 2\sqrt{2}$
 $\tan \theta = \frac{\text{opp}}{\text{adj.}} = \frac{1}{2\sqrt{2}} \text{ or } \frac{\sqrt{2}}{4}$

10. $\cos \theta = \frac{8}{17} = \frac{\text{adj.}}{\text{hyp.}}$

 $8^2 + y^2 = 17^2$
 $y^2 = 289 - 64$
 $y = 15$
 $\sin(90^\circ - \theta) = \frac{8}{17}$

11. $\tan 60^\circ = \frac{h}{35}$
 $h = 35 \tan 60^\circ = 60.62 \text{ m}$

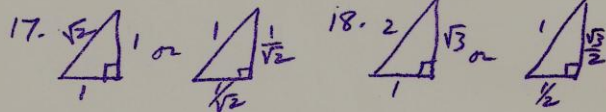


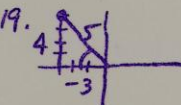
12. $.5920$

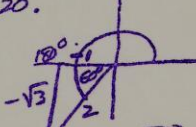
13. $.7347$

14. 3.28

15. $\frac{16\pi}{3} = 5\pi + \frac{\pi}{3}$



19. 
 $\sin \theta = \frac{4}{5}$
 $\cos \theta = -\frac{3}{5}$
 $\tan \theta = -\frac{4}{3}$

20. 
 $\sin \theta = \frac{-\sqrt{3}}{2}$

21. $\sin \theta = -\frac{1}{4}$, $\cos \theta > 0$.

$x^2 + (-1)^2 = 4^2$
 $x^2 = 15$
 $x = \sqrt{15}$
 $\cos \theta = \frac{\sqrt{15}}{4}$
 $\csc \theta = -4$

22. (1)

23. $\sin(a + \frac{3\pi}{2}) = \sin a \cos \frac{3\pi}{2} + \cos a \sin \frac{3\pi}{2}$
 $= \sin a \cdot 0 + \cos a \cdot (-1) = -\cos a$

24. $\tan(a + \pi) = \frac{\tan a + \tan \pi}{1 - \tan a \tan \pi} = \frac{\tan a + 0}{1 - \tan a \cdot 0} = \tan a$

25. $\cos(2\pi - a) = \cos 2\pi \cos a + \sin 2\pi \sin a$
 $= 1 \cdot \cos a + 0 \cdot \sin a = \cos a$

26-28. See Textbook.