

Please do all work on a separate sheet of paper.

- 1) Convert the angle $32^{\circ}27'$ to decimal degrees.
- 2) Convert the angle $54^{\circ}42'16''$ to decimal degrees.
- 3) Convert the angle 197.41° to degrees, minutes, and seconds.
- 4) Convert the angle 93.89° to degrees, minutes, and seconds.
- 5) Convert 144° from degrees to radians.
- 6) Convert 57.82° from degrees to radians.
- 7) Convert $\frac{\pi}{5}$ to degrees.
- 8) Convert $\frac{7\pi}{10}$ to degrees.
- 9) Convert 6 to degrees.
- 10) Use the arc length formula to find s if $r = 14$ ft and $\theta = 39^{\circ}$.
- 11) Use the arc length formula to find r if $s = 7.8$ ft and $\theta = \frac{\pi}{4}$.
- 12) Use the arc length formula to find θ if $r = 3$ m and $s = 2$ m.
- 13) The minute hand of a clock is 9 inches long. What distance does the tip move in 19 minutes?
- 14) If $\sin \theta = \frac{6}{7}$, find $\cos \theta$.
- 15) If $\cos \theta = \frac{2}{3}$, find $\sec \theta$.
- 16) If $\cos \theta = \frac{3}{4}$, find $\tan \theta$.
- 17) If $\tan \theta = \frac{1}{5}$, find $\csc \theta$.

18) Find the exact value of $\tan \frac{\pi}{3}$.

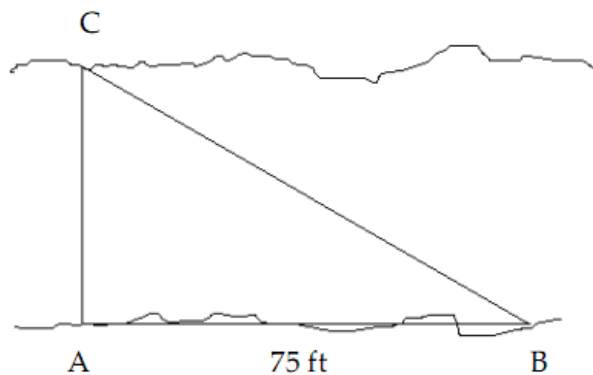
19) Find the exact value of $\sec \frac{\pi}{4}$.

20) Find the exact value of $\tan \left(-\frac{17\pi}{6} \right)$.

21) Find the exact value of $\cot \frac{121\pi}{2}$.

22) From the top of a cliff, the angle of depression to a boat anchored 43 feet from the base of the cliff is 63° . Estimate the height of the cliff to the nearest foot.

23) To measure the width of a river, a surveyor starts at point A on one bank and walks 75 feet down the river to point B. He then measures the angle ABC to be $20^\circ 32' 11''$. Estimate the width of the river to the nearest foot.



24) Find the measure of two coterminal angles, one positive and one negative, for -269° .

25) Find the measure of two coterminal angles, one positive and one negative, for $\frac{9\pi}{5}$.

26) Find the measure of two coterminal angles, one positive and one negative, for $-\frac{19\pi}{5}$.

27) Suppose that θ is in standard position and the terminal side passes through the point $(9, 12)$.

Find $\sin \theta$.

28) Find the exact value of $\tan\left(-\frac{2\pi}{3}\right)$.

29) Find the exact value of $\csc\frac{4\pi}{3}$.

30) Evaluate $\tan 1080^\circ$.

31) Find $\sec \beta$, if $\sin \beta = -\frac{7}{10}$ and $\tan \beta > 0$.

32) From a boat on a lake, the angle of elevation to the top of a cliff is $32^\circ 39'$. If the base of cliff is 770 feet from the boat, how high is the cliff (to the nearest foot)?

33) Find (if possible) the complement and supplement of $\frac{9\pi}{13}$ (in radian measure).

34) Identify the quadrant and the reference angle for $-\frac{3\pi}{4}$.

35) Find (to the nearest minute) the latitude of Toronto, Canada, if Toronto and Charleston, SC, $32^\circ 58' N$, are 1100 km apart. Assume the radius of the earth is 6400 km and the two cities lie on the same north-south line.

Answer Key

1) 32.45°

2) 54.70°

3) $197^\circ 24' 36''$

4) $93^\circ 53' 24''$

5) $\frac{4\pi}{5}$

6) 1.0091

7) 36°

8) 126°

9) 343.77°

10) $\frac{91\pi}{30}$ ft

11) $\frac{31.2}{\pi}$ ft

12) $\frac{2}{3}$ rad

13) $\frac{57\pi}{10}$ in

14) $\frac{\sqrt{13}}{7}$

15) $\frac{3}{2}$

16) $\frac{\sqrt{7}}{3}$

17) $\sqrt{26}$

18) $\sqrt{3}$

19) $\sqrt{2}$

20) $\frac{\sqrt{3}}{3}$

21) 0

22) 84 feet

23) 28 feet

24) $91^\circ, -629^\circ$

25) $\frac{19\pi}{5}, -\frac{\pi}{5}$

26) $-\frac{9\pi}{5}, -\frac{29\pi}{5}, \frac{\pi}{5}$

27) $\frac{4}{5}$

28) $\sqrt{3}$

29) $-\frac{2\sqrt{3}}{3}$

30) 0

31) $-\frac{10\sqrt{51}}{51}$

32) 493 feet

33) No complement

Supplement = $\frac{4\pi}{13}$

34) Quadrant III

Reference Angle = $\frac{\pi}{4}$

35) $42^\circ 49' N$