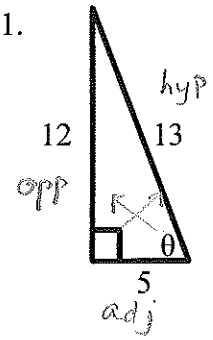
Unit 9 Review - Trigonometry
Advanced Algebra

Name: Key
Period: _____ Date: _____

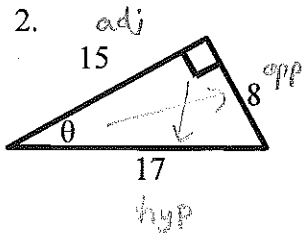
Write the six trigonometric functions for angle θ.

1. 

$\sin\theta = \frac{o}{h} = \frac{12}{13}$ $\csc\theta = \frac{h}{o} = \frac{13}{12}$

$\cos\theta = \frac{a}{h} = \frac{5}{13}$ $\sec\theta = \frac{h}{a} = \frac{13}{5}$

$\tan\theta = \frac{o}{a} = \frac{12}{5}$ $\cot\theta = \frac{a}{o} = \frac{5}{12}$

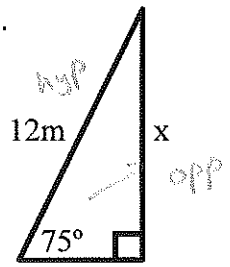
2. 

$\sin\theta = \frac{8}{17}$ $\csc\theta = \frac{17}{8}$

$\cos\theta = \frac{15}{17}$ $\sec\theta = \frac{17}{15}$

$\tan\theta = \frac{8}{15}$ $\cot\theta = \frac{15}{8}$

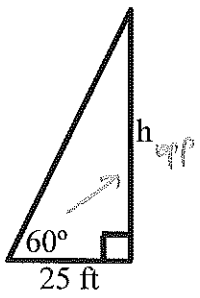
Solve for the variable. The final answer may be written in simplest radical form, or rounded to the nearest hundredth (two decimal places).

3. 

$\sin 75° = \frac{x}{12}$

$x = 12 \cdot \sin 75°$

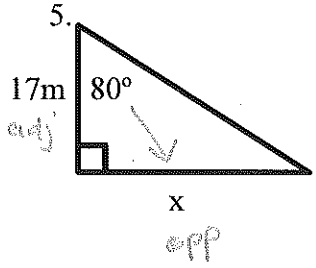
11.59

4. 

$\tan 60° = \frac{h}{25}$

$h = 25 \cdot \tan 60°$

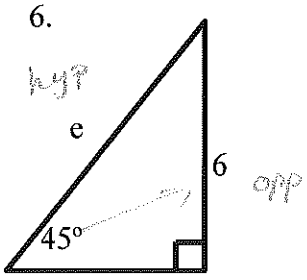
43.30 ft

5. 

$\tan 80° = \frac{x}{17}$

$x = 17 \cdot \tan 80°$

96.41 m

6. 

$\sin 45° = \frac{6}{e}$

$e \cdot \sin 45° = 6$

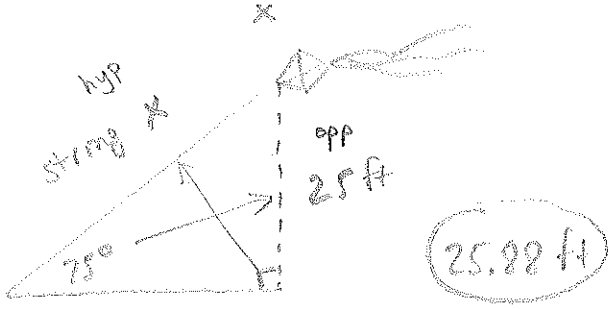
$\frac{e \cdot \sin 45°}{\sin 45°} = \frac{6}{\sin 45°}$

$e = \frac{6}{\sin 45°}$

8.49

Use the space below to create a diagram and solve the word problems. Round your answers to two decimal places.

7. The height of the kite is 25 feet. The string to the kite makes an angle of 75° to the ground. How long is the string to the kite?

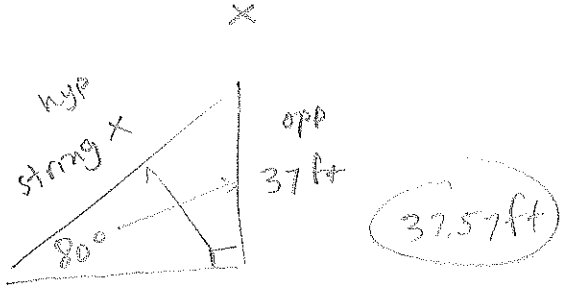


25.88 ft

$\sin 75° = \frac{25}{x}$

$x \cdot \frac{\sin 75°}{\sin 75°} = \frac{25}{\sin 75°}$

8. The height of the kite is 37 feet. The string to the kite makes an angle of 80° to the ground. How long is the string to the kite?



37.57 ft

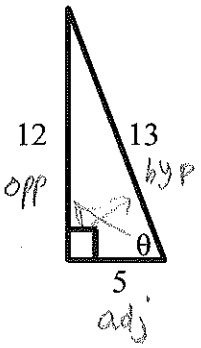
$\sin 80° = \frac{37}{x}$

$x \cdot \frac{\sin 80°}{\sin 80°} = \frac{37}{\sin 80°}$

*Many ways to do problems 9-12.

Determine the measure of the indicated angle in each of the following diagrams. Round to nearest degree.

9.

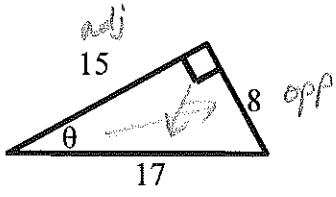


$\cos\theta = \frac{5}{13}$

$\cos^{-1}\cos\theta = \cos^{-1}\left(\frac{5}{13}\right)$

$\theta \approx 67°$

10.

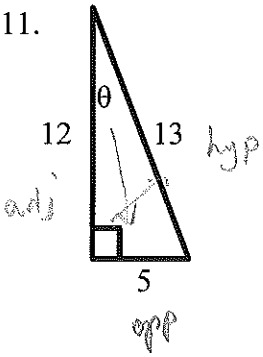


$\sin\theta = \frac{8}{17}$

$\sin^{-1}\sin\theta = \sin^{-1}\left(\frac{8}{17}\right)$

$\theta = 28°$

11.

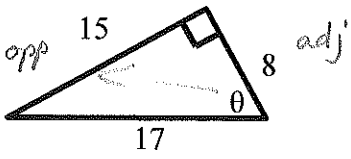


$\tan\theta = \frac{5}{12}$

$\tan^{-1}\tan\theta = \tan^{-1}\left(\frac{5}{12}\right)$

$\theta = 23°$

12.



$\cos\theta = \frac{8}{17}$

$\cos^{-1}\cos\theta = \cos^{-1}\left(\frac{8}{17}\right)$

$\theta = 62°$

Solve each function. Round your answers to the nearest hundredth (two decimal places).

13. $\cos^{-1}(0.63) =$ 50.95

14. $\sin^{-1}(0.91) =$ 65.51

15. $\sin\theta = 0.8$

$\sin^{-1}\sin\theta = \sin^{-1}(0.8)$

$\theta = 53.13$

16. $\tan\theta = 0.6$

$\tan^{-1}\tan\theta = \tan^{-1}(0.6)$

$\theta = 30.96$

Change the radian measures to degree measures.

17. $\frac{3\pi}{4} \cdot \frac{180}{\pi}$ → 135°

18. $\frac{-5\pi}{3} \cdot \frac{180}{\pi}$ → −300°

19. $\frac{6\pi}{5} \cdot \frac{180}{\pi}$ → 216°

20. $\frac{-3\pi}{20} \cdot \frac{180}{\pi}$ → −27°

21. $\frac{14\pi}{9} \cdot \frac{180}{\pi}$ → 280°

Change the degree measures to radian measures.

22. $-270°$

$-270 \cdot \frac{\pi}{180}$

$-\frac{3\pi}{2}$

23. $340°$

$340 \cdot \frac{\pi}{180}$

$\frac{17\pi}{9}$

24. $-420°$

$-420 \cdot \frac{\pi}{180}$

$-\frac{7\pi}{3}$

25. $145°$

$145 \cdot \frac{\pi}{180}$

$\frac{29\pi}{36}$

26. $-72°$

$-72 \cdot \frac{\pi}{180}$

$-\frac{2\pi}{5}$

Find three angles (positive or negative) that are co-terminal with each angle.

27. 160°

+360 → 520 → 160 −360 → −200°

28. −25°

−25 +360 → 335° → 335 +360 → 695°

420 +360 → 780

29. 375°

375 −360 → 15° → 375° +360 → 735°

−25 −360 → −385°

30. −422°

−422 +360 → −62° → −62 +360 → 298°

15 −360 → −345°

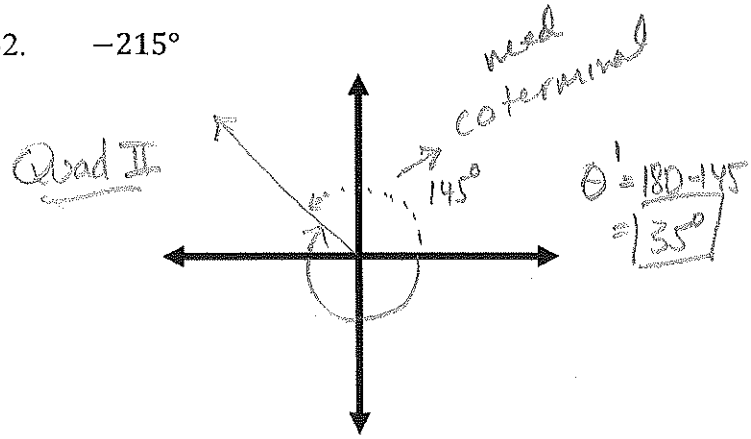
31. 11°

11 +360 → 371° → 371° −360 → 11°

298 +360 → 658°

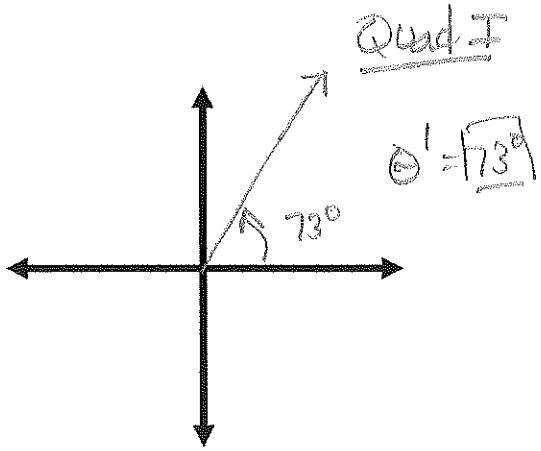
Sketch the given angle and determine the quadrant in which it lands. Then, find the measure of its reference angle.

32. −215°



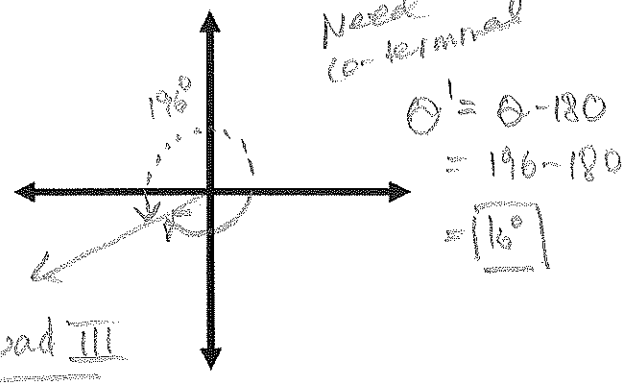
$\theta' = 180 - 145 = 35°$

33. 73°



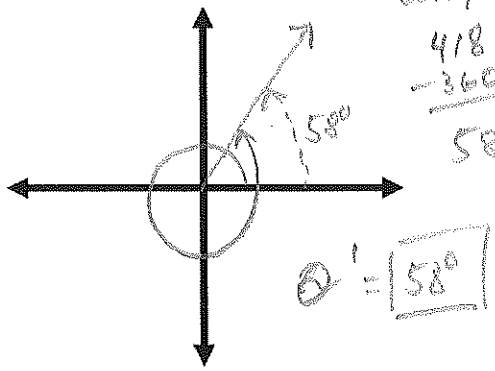
$\theta' = 73°$

34. −164°



$\theta' = \theta - 180 = 196 - 180 = 16°$

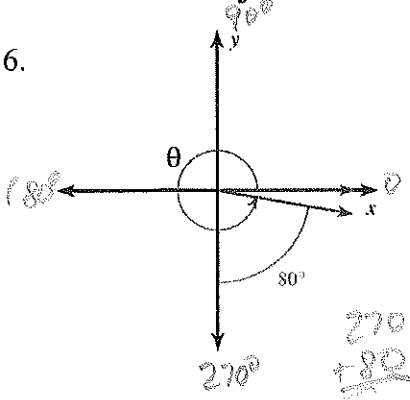
35. 418°



$\theta' = 58°$

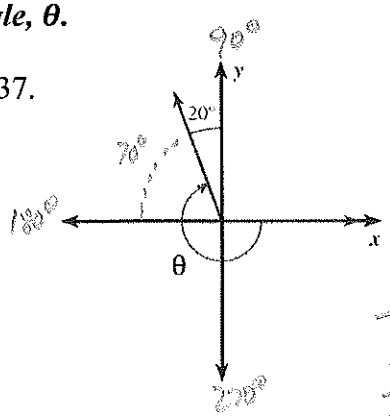
Find the measure of the indicted angle, θ.

36.



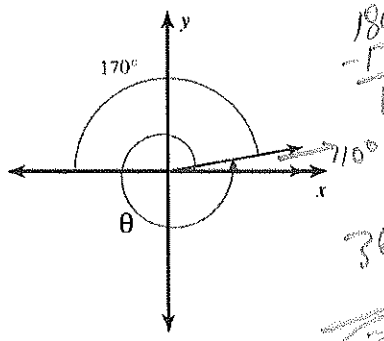
270 +80 → 350°

37.



−180 −70 → −250°

38.

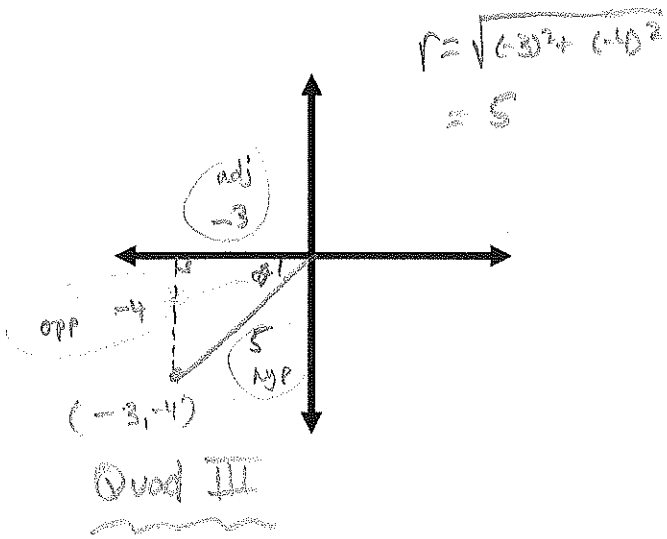


180 −170 → 10°

360 −10 → 350°

Find the exact values of the six trigonometric functions, given the terminal side of θ contains the given point.

39. $(-3,-4)$

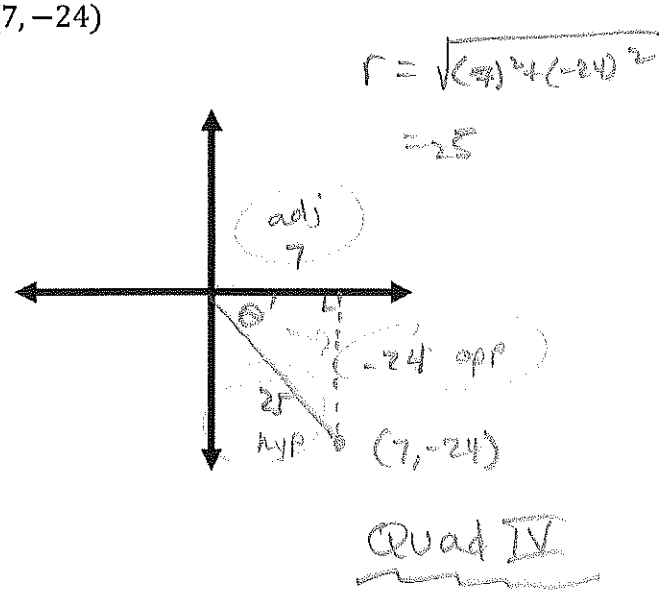


$\sin\theta = \frac{-4}{5}$ $\csc\theta = \frac{5}{-4}$

$\cos\theta = \frac{-3}{5}$ $\sec\theta = \frac{5}{-3}$

$\tan\theta = \frac{-4}{-3} = \frac{4}{3}$ $\cot\theta = \frac{3}{4}$

40. $(7,-24)$



$\sin\theta = \frac{-24}{25}$ $\csc\theta = \frac{25}{-24}$

$\cos\theta = \frac{7}{25}$ $\sec\theta = \frac{25}{7}$

$\tan\theta = \frac{-24}{7}$ $\cot\theta = \frac{7}{-24}$