

TRIGONOMETRY - ANSWERS

T.1 Exercises

1. Complementary, 180

5. 20.075°

9. 15.168°

13. $65^\circ 0' 5''$

17. $83^\circ 59'$

21. $28^\circ 03' 03''$

25. $45^\circ, 135^\circ$

29. $180 - \theta^\circ$

3. coterminal, 360

7. 274.304°

11. $18^\circ 0' 45''$

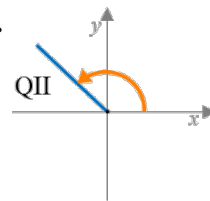
15. $175^\circ 23' 58''$

19. $33^\circ 50'$

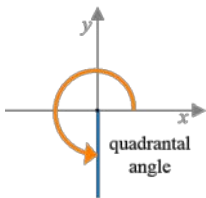
23. $60^\circ, 150^\circ$

27. $74^\circ 30', 164^\circ 30'$

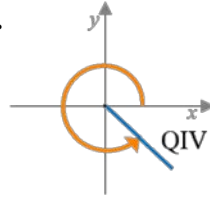
31.



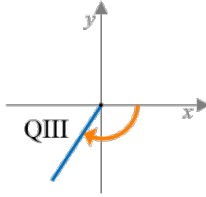
33.



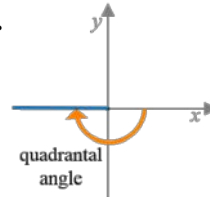
35.



37.



39.



41. 15°

43. 135°

45. $30^\circ + k \cdot 360^\circ$

47. $k \cdot 360^\circ$

49. $\alpha^\circ + k \cdot 360^\circ$

51. 7.5°

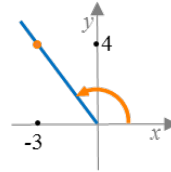
T.2 Exercises

1. $\sin \theta = \frac{3}{5}$, $\cos \theta = \frac{4}{5}$, $\tan \theta = \frac{3}{4}$

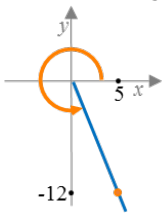
5. $\sin \theta = \frac{n}{\sqrt{n^2+4}}$, $\cos \theta = \frac{2}{\sqrt{n^2+4}}$, $\tan \theta = \frac{n}{2}$

3. $\sin \theta = \frac{\sqrt{3}}{2}$, $\cos \theta = \frac{1}{2}$, $\tan \theta = \sqrt{3}$

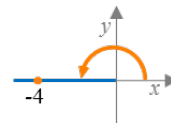
7. $\sin \theta = \frac{4}{5}$, $\cos \theta = -\frac{3}{5}$, $\tan \theta = -\frac{4}{3}$



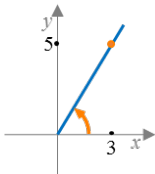
9. $\sin \theta = -\frac{12}{13}$, $\cos \theta = \frac{5}{13}$, $\tan \theta = -\frac{12}{5}$



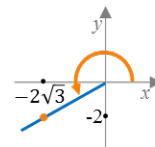
11. $\sin \theta = 0$, $\cos \theta = -1$, $\tan \theta = 0$



13. $\sin \theta = \frac{5\sqrt{34}}{34}$, $\cos \theta = \frac{3\sqrt{34}}{34}$, $\tan \theta = \frac{5}{3}$



15. $\sin \theta = -\frac{1}{2}$, $\cos \theta = -\frac{\sqrt{3}}{2}$, $\tan \theta = \frac{\sqrt{3}}{3}$



17. sine and cosine is negative, tangent is positive

19. negative

21. negative

23. positive

25. positive

27. negative

29. 1

31. -1

33. 0

35. 0

37. *undefined*

39. $\cos \beta = -\frac{\sqrt{5}}{3}$

$$\tan \beta = \frac{2\sqrt{5}}{5}$$

T.3 Exercises

1. approximated

3. reference, acute, x -axis

5. 0.6000

7. -0.9106

9. $\frac{\sqrt{2}}{2}$
11. $\frac{\sqrt{3}}{2}$
13. $\frac{1}{2}$
15. 1
17. $\cos 67.5^\circ$
19. 82°
21. 13°
23. 6°
25. *QIII* and *QIV*
27. *QII*
29. *QIV*
31. negative
33. negative
35. positive
37. positive
39. $\frac{\sqrt{3}}{2}$
41. $\frac{1}{2}$
43. $-\frac{\sqrt{3}}{2}$
45. 1
47. $60^\circ, 300^\circ$
49. $60^\circ, 120^\circ$
51. $135^\circ, 225^\circ$
53. $150^\circ, 330^\circ$
55. $\sin \alpha = -\frac{4}{5}$
 $\tan \alpha = -\frac{4}{3}$

T.4 Exercises

1. solve, three, sides
3. inverse
5. 25, East, South
7. 37.8°
9. 138.6°
11. 48.6°
13. $a \approx 19.3$, $\angle B = 51.5^\circ$, $c \approx 24.3$
15. $a \approx 15.3$, $\angle B = 48^\circ$, $c \approx 22.9$
17. $\angle A = 26^\circ 48'$, $a \approx 9.6$, $c \approx 21.4$
19. $a = 4$, $b = 4\sqrt{3}$, $d = 4\sqrt{6}$, $h = 4\sqrt{3}$
21. $a = 3\sqrt{6}$, $b = 3\sqrt{6}$, $c = 12$, $d = 6\sqrt{3}$
23. 48 m
25. 88.3 ft
27. 14°
29. 134.7 cm
31. 324.5 km in the direction of 193.3°
33. 2.4 m/s
35. 75°
37. Yes, the car is speeding at 94.8 kph.

T.5 Exercises

1. oblique
5. longest, angle
9. area, sides
13. $\angle F \approx 28.0^\circ$, $\angle G \approx 31^\circ$, $g \approx 43.8$ m
17. $\angle B = 10^\circ$, $b \approx 69.5$, $c \approx 136.8$
21. $\angle A \approx 17.8^\circ$, $b \approx 56.6$ ft, $\angle C \approx 21.2^\circ$
25. $\angle E \approx 118.6^\circ$, $\angle F \approx 25^\circ$, $\angle G \approx 36.4^\circ$
29. $\angle A \approx 112.8^\circ$, $\angle B \approx 19^\circ$, $\angle C \approx 48.2^\circ$
33. ~ 1687 m
37. ~ 1.93 mi
41. ~ 100.2 m²
45. ~ 218.1 ft
49. $\theta \approx 18.6^\circ$
3. three, enclosed, cosines
7. ambiguous, cosines, largest
11. $y \approx 13.8$ m, $\angle Z = 78.4^\circ$, $c \approx 15.5$ m
15. $\angle R \approx 24.7^\circ$, $\angle S \approx 114.3^\circ$, $r \approx 11.5$ k
19. $\angle B \approx 18^\circ 13' 26''$, $\angle C \approx 51^\circ 31' 34''$, $c \approx 40.1$
23. $\angle R \approx 32.2^\circ$, $\angle S \approx 91.4^\circ$, $\angle T \approx 56.4.1^\circ$
27. $\angle A \approx 28.3^\circ$, $b \approx 45$, $\angle C \approx 39.7^\circ$
31. $AB \approx 118$ m
35. ~ 8.9 mi
39. ~ 9.9 ft
43. $\sim 19.2^\circ$
47. ~ 372.7 m²
51. ~ 3.85 m²