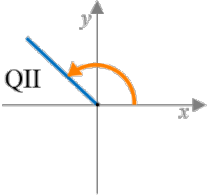
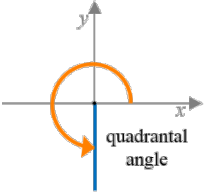
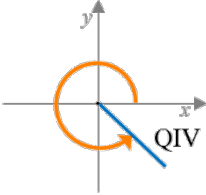
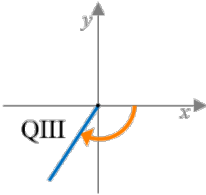
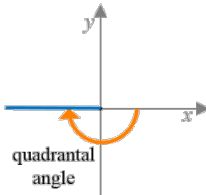


Trigonometry - ANSWERS

T1 Exercises

1. 20.075°
5. 15.168°
9. $65^\circ 0' 5''$
13. $83^\circ 59'$
17. $28^\circ 03' 03''$
21. $45^\circ, 135^\circ$
25. $180 - \theta^\circ$
3. 274.304°
7. $18^\circ 0' 45''$
11. $175^\circ 23' 58''$
15. $33^\circ 50'$
19. $60^\circ, 150^\circ$
23. $74^\circ 30', 164^\circ 30'$
27. 
29. 
31. 
33. 
35. 
37. 15°
41. $30^\circ + k \cdot 360^\circ$
45. $\alpha^\circ + k \cdot 360^\circ$
39. 135°
43. $k \cdot 360^\circ$
47. 7.5°

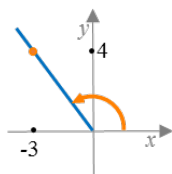
T2 Exercises

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

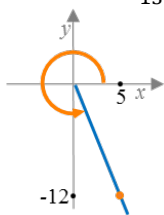
$$3. \sin \theta = \frac{\sqrt{3}}{2}, \cos \theta = \frac{1}{2}, \tan \theta = \sqrt{3}, \csc \theta = \frac{2\sqrt{3}}{3}, \sec \theta = 2, \cot \theta = \frac{\sqrt{3}}{3}$$

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

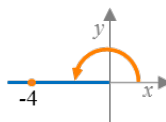
$$7. \sin \theta = \frac{4}{5}, \cos \theta = -\frac{3}{5}, \tan \theta = -\frac{4}{3}$$



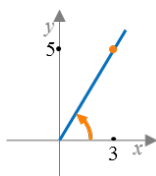
$$9. \sin \theta = -\frac{12}{13}, \cos \theta = \frac{5}{13}, \tan \theta = -\frac{12}{5}$$



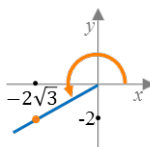
$$11. \sin \theta = 0, \cos \theta = -1, \tan \theta = 0$$



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



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



17. sine, cosine, cosecant and secant are negative, tangent and cotangent are positive

19. negative

21. negative

25. positive

29. 1

33. 0

37. 0

23. positive

27. negative

31. -1

35. undefined

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

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

T3 Exercises

1. 0.6000
3. -0.9106
5. $\frac{\sqrt{2}}{2}$
7. $\frac{\sqrt{3}}{2}$
9. $\frac{1}{2}$
11. 1
13. $\cos 67.5^\circ$
15. 82°
17. 13°
19. 6°
21. QIII and QIV
23. QII
25. QIV
27. negative
29. negative
31. positive
33. positive
35. $\frac{\sqrt{3}}{2}$
37. $\frac{1}{2}$
39. $-\frac{\sqrt{3}}{2}$
41. 1
43. $60^\circ, 300^\circ$
45. $60^\circ, 120^\circ$
47. $135^\circ, 225^\circ$
49. $150^\circ, 330^\circ$
51. $\sin \alpha = -\frac{4}{5}$
 $\tan \alpha = -\frac{4}{3}$

T4 Exercises

1. 52.2°
3. 68.4°
5. 60°
7. $\angle B = 54^\circ$, $b \approx 16.5$, $c \approx 20.4$
9. $\angle A \approx 31.0^\circ$, $\angle B \approx 59.0^\circ$, $c \approx 17.5$
11. $\angle A \approx 74.4^\circ$, $\angle B \approx 15.6^\circ$, $b \approx 2.6$
13. $a = 2\sqrt{3}$, $b = 6\sqrt{3}$, $d = 4\sqrt{3}$, $h = 6$
15. $a = 5$, $b = \frac{5}{2}$, $h = \frac{5\sqrt{3}}{2}$, $s = 5$
17. $32\sqrt{3}$ cm
19. 23°
21. 700 m
23. 317 m
25. 1101 km; direction of 107° (or S73°E)
27. 552 m; 447 m
29. 29.6 m
31. 237 m

T5 Exercises

1. $\angle P = 39^\circ$, $p \approx 15.3$ cm, $s \approx 22.8$ cm
3. $\angle A \approx 25.9^\circ$, $\angle C \approx 18.1^\circ$, $c \approx 19.3$ ft
5. $\angle I \approx 19.8^\circ$, $i \approx 8.8$ cm, $\angle J \approx 122.2^\circ$
7. $b = 10$, $\angle C = 120^\circ$, $c \approx 17.3$
9. $\angle A \approx 25.6^\circ$, $a \approx 10.5$, $\angle B \approx 9.4^\circ$
11. $\angle X \approx 40.6^\circ$, $y \approx 18.4$ m, $\angle Z \approx 54.4^\circ$
13. $p \approx 19.8$ m, $\angle R \approx 33.1^\circ$, $\angle S \approx 129.9^\circ$
15. $\angle I \approx 48.5^\circ$, $\angle J \approx 86.3^\circ$, $\angle K \approx 45.2^\circ$
17. $\angle A \approx 17^\circ$, $\angle B \approx 103^\circ$, $c \approx 8.9$
19. $\angle A \approx 29.0^\circ$, $\angle B \approx 46.6^\circ$, $\angle C \approx 104.4^\circ$
21. No, because the ratio of sines of angles is not the same as the ratios of those angles.
For instance, $\frac{\sin 90^\circ}{\sin 45^\circ} = \sqrt{2} \neq \frac{90^\circ}{45^\circ} = 2$.
23. 128 m
25. 8.1 km; 11.0 km
27. ~ 6.4 m
29. ~ 351 m from A ; ~ 295 from B
31. ~ 777 km; direction: $\sim 279^\circ 2'$
33. $\sim 26^\circ$
35. ~ 76 m
37. ~ 1199 m²
39. $\sim 69^\circ$
41. ~ 663.5 m²