Trigonometry - ANSWERS

T1 Exercises

1. $20.075°$

3. $274.304°$

5. $15.168°$

7. $18°0'45''$

9. $65°0'5''$

11. $175°23'58''$

13. $83°59'$

15. $33°50'$

17. $28°03'03''$

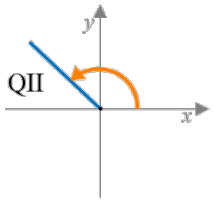
19. $60°, 150°$

21. $45°, 135°$

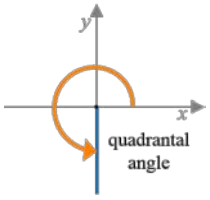
23. $74°30', 164°30'$

25. $180 - \theta°$

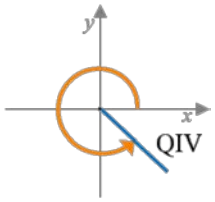
27.



29.



31.



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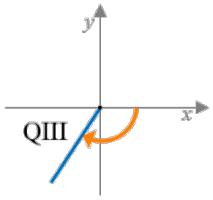
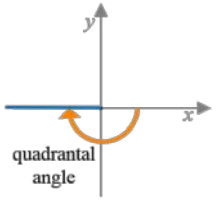


35.



37. $15°$

39. $135°$

41. $30° + k \cdot 360°$

43. $k \cdot 360°$

45. $\alpha° + k \cdot 360°$

47. $7.5°$

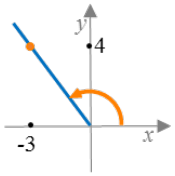
T2 Exercises

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

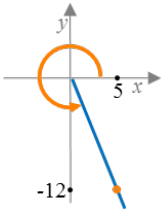
3. $\sin\theta = \frac{\sqrt{3}}{2}$, $\cos\theta = \frac{1}{2}$, $\tan\theta = \sqrt{3}$

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

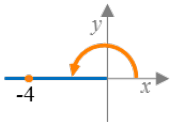
7. $\sin\theta = \frac{4}{5}$, $\cos\theta = -\frac{3}{5}$, $\tan\theta = -\frac{4}{3}$



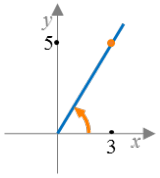
9. $\sin\theta = -\frac{12}{13}$, $\cos\theta = \frac{5}{13}$, $\tan\theta = -\frac{12}{5}$



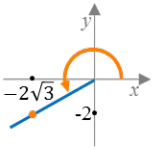
11. $\sin\theta = 0$, $\cos\theta = -1$, $\tan\theta = 0$



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

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

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. $\cos 67.5°$

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. $60°, 300°$

45. $60°, 120°$

47. $135°, 225°$

49. $150°, 330°$

51. $\sin\alpha = -\frac{4}{5}$
$\tan\alpha = -\frac{4}{3}$

T4 Exercises

1. $52.2°$

3. $68.4°$

5. $60°$

7. $\angle B = 54°,\ b \simeq 16.5,\ c \simeq 20.4$

9. $\angle A \simeq 31.0°,\ \angle B \simeq 59.0°,\ c \simeq 17.5$

11. $\angle A \simeq 74.4°,\ \angle B \simeq 15.6°,\ b \simeq 2.6$

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 **S**$73°$**E**)

27. 552 m; 447 m

29. 29.6 m

31. 237 m

T5 Exercises

1. $\angle P = 39°,\ p \simeq 15.3$ cm, $s \simeq 22.8$ cm

3. $\angle A \simeq 25.9°,\ \angle C \simeq 18.1°,\ c \simeq 19.3$ ft

5. $\angle I \simeq 19.8°,\ i \simeq 8.8$ cm, $\angle J \simeq 122.2$

7. $b = 10,\ \angle C = 120°,\ c \simeq 17.3$

9. $\angle A \simeq 25.6°,\ a \simeq 10.5,\ \angle B \simeq 9.4°$

11. $\angle X \simeq 40.6°,\ y \simeq 18.4$ m, $\angle Z \simeq 54.4°$

13. $p \simeq 19.8$ m, $\angle R \simeq 33.1°,\ \angle S \simeq 129.9°$

15. $\angle I \simeq 48.5°,\ \angle J \simeq 86.3°,\ \angle K \simeq 45.2°$

17. $\angle A \simeq 17°,\ \angle B \simeq 103°,\ c \simeq 8.9$

19. $\angle A \simeq 34.7°,\ \angle B \simeq 48.1°,\ \angle C \simeq 97.2°$

21. No, because the ratio of sines of angles is not the same as the ratios of those angles. For instance, $\frac{\sin 90°}{\sin 45°} = \sqrt{2} \neq \frac{90°}{45°} = 2$.

23. 127 m

25. 8.1 km; 11.0 km

27. ~ 6.4 m

29. ~ 351 m from A; ~ 295 from B

31. ~ 777 km; direction: ~ 279°2′

33. ~26°

35. ~76 m

37. ~ 1199 m^2

39. ~ 69°

41. ~247.3 m^2