

**MAKE SURE YOU ARE IN
DEGREE MODE
Section 7.2 – Practice Problems**

$\sin \theta = \frac{y}{r}$ $\cos \theta = \frac{x}{r}$
 $\tan \theta = \frac{y}{x}$

If the following angles satisfy the given conditions, what quadrant are they found in?

1. $\cos \theta < 0$ Q2 and Q3	2. $\tan \theta > 0$ Q1 and Q3
3. $\sin \theta < 0$ Q3 and Q4	4. $\sin \theta > 0$ and $\tan \theta < 0$ Q2
5. $\cos \theta < 0$ and $\tan \theta > 0$ Q3	6. $\sin \theta < 0$ and $\cos \theta > 0$ Q4
7. $\sin \theta > 0$ and $\tan \theta > 0$ Q1	8. $\cos \theta < 0$ and $\tan \theta < 0$ Q2
9. $\sin \theta < 0$ and $\tan \theta < 0$ Q4	10. $\sin < 0$ and $\cos \theta < 0$ Q3

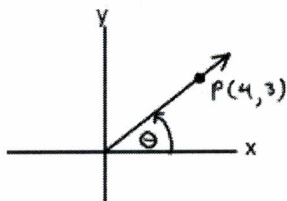
Given is a point on the terminal side of θ is shown. Evaluate the three trigonometric functions of θ

11. $r^2 = 4^2 + 3^2$
 $r = 5$

$\sin \theta = \frac{3}{5}$

$\cos \theta = \frac{4}{5}$

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

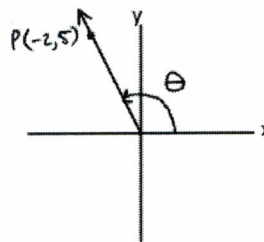


12.

$r^2 = (-2)^2 + (5)^2$
 $r^2 = 29$
 $r = \sqrt{29}$

$\sin \theta = \frac{5}{\sqrt{29}}$
 $\cos \theta = -\frac{2}{\sqrt{29}}$

$\tan \theta = -\frac{5}{2}$



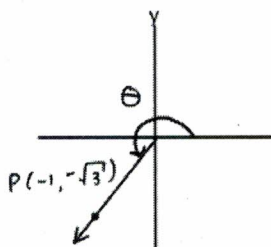
13.

$r^2 = (-1)^2 + (-\sqrt{3})^2$
 $r^2 = 4$
 $r = 2$

$\sin \theta = -\frac{\sqrt{3}}{2}$

$\cos \theta = -\frac{1}{2}$

$\tan \theta = +\sqrt{3}$



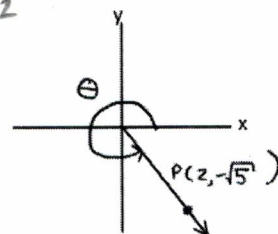
14.

$r^2 = 2^2 + (-\sqrt{5})^2$
 $r^2 = 9$
 $r = 3$

$\sin \theta = -\frac{\sqrt{5}}{3}$

$\cos \theta = \frac{2}{3}$

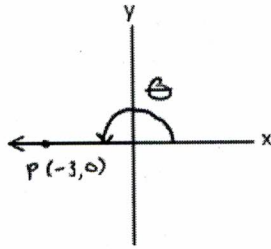
$\tan \theta = -\frac{\sqrt{5}}{2}$



$$15. \quad r^2 = (-3)^2 + 0^2$$

$$r^2 = 9$$

$$r = 3$$



$$\cos \theta = \frac{-3}{3} = -1$$

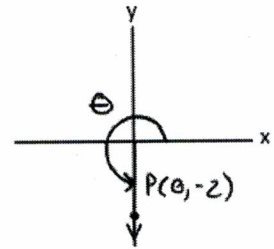
$$\sin \theta = \frac{0}{3} = 0$$

$$\tan \theta = \frac{0}{-3} = 0$$

$$16. \quad r^2 = 0 + (-2)^2$$

$$r^2 = 4$$

$$r = 2$$



$$\sin \theta = \frac{-2}{2} = -1$$

$$\cos \theta = \frac{0}{2} = 0$$

$$\tan \theta = \frac{-2}{0} = \text{undefined}$$

If θ is in Standard Position and the given point is on the terminal side of θ , find the values of the three trigonometric functions of θ

$$17. (3, -4) \quad r = 5$$

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

$$\cos \theta = \frac{3}{5} \quad \tan \theta = -\frac{4}{3}$$

$$18. (-12, 5) \quad r = 13$$

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

$$\cos \theta = -\frac{12}{13}$$

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

$$19. (-7, -24)$$

$$r = \sqrt{49 + 576}$$

$$r = 25$$

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

$$\cos \theta = -\frac{7}{25} \quad \tan \theta = \frac{24}{7}$$

$$20. (8, 15)$$

$$r = \sqrt{8^2 + 15^2} = 17$$

$$\sin \theta = \frac{15}{17}$$

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

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

$$21. (-2\sqrt{3}, 2)$$

$$r = \sqrt{(-2\sqrt{3})^2 + 4}$$

$$r = \sqrt{16} = 4$$

$$\sin \theta = \frac{2}{4} = \frac{1}{2}$$

$$\tan \theta = \frac{2}{-2\sqrt{3}}$$

$$\cos \theta = -\frac{2\sqrt{3}}{4} = -\frac{\sqrt{3}}{2} = -\frac{1}{\sqrt{3}} \text{ or } -\frac{\sqrt{3}}{3}$$

$$22. (\sqrt{2}, \sqrt{7})$$

$$r = \sqrt{2 + 7}$$

$$r = \sqrt{9} = 3$$

$$\sin \theta = \frac{\sqrt{7}}{3}$$

$$\tan \theta = \frac{\sqrt{7}}{\sqrt{2}} = \frac{\sqrt{14}}{2}$$

$$\cos \theta = \frac{\sqrt{2}}{3}$$

23. $(-3, -3)$

$$r = \sqrt{(-3)^2 + (-3)^2}$$

$$\sin \theta = \frac{-3}{3\sqrt{2}} = -\frac{1}{\sqrt{2}} \text{ or } -\frac{\sqrt{2}}{2}$$

$$\cos \theta = -\frac{\sqrt{2}}{2}$$

$$\tan \theta = 1$$

24. $(0, 4)$

$$r = 4$$

$$\sin \theta = 1$$

$$\cos \theta = 0$$

$$\tan \theta = \text{undefined}$$

25. $(-2, 0)$

$$r = 2$$

$$\sin \theta = 0$$

$$\cos \theta = -1$$

$$\tan \theta = 0$$

26. $(-\sqrt{5}, 2)$

$$r = \sqrt{(-\sqrt{5})^2 + 4} = 3$$

$$\sin \theta = \frac{2}{3}$$

$$\tan \theta = \frac{2}{\sqrt{5}} \text{ or } \frac{-2\sqrt{5}}{5}$$

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

27. $(-5, 5)$

$$r = \sqrt{(-5)^2 + 5^2}$$

$$r = \sqrt{50} = 5\sqrt{2}$$

$$\sin \theta = \frac{5}{5\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\tan \theta = -1$$

$$\cos \theta = -\frac{5}{5\sqrt{2}} = -\frac{\sqrt{2}}{2}$$

28. $(-2\sqrt{2}, 1)$

$$r = \sqrt{(-2\sqrt{2})^2 + 1}$$

$$= \sqrt{9} = 3$$

$$\sin \theta = \frac{1}{3}$$

$$\tan \theta = -\frac{1}{2\sqrt{2}} \text{ or } -\frac{\sqrt{2}}{4}$$

$$\cos \theta = -\frac{2\sqrt{2}}{3}$$

29. $(-40, -9)$

$$r = \sqrt{(-40)^2 + (-9)^2}$$

$$= 41$$

$$\sin \theta = -\frac{9}{41}$$

$$\tan \theta = \frac{9}{40}$$

$$\cos \theta = -\frac{40}{41}$$

30. $(9, -40)$

Same r as 29.

$$\sin \theta = -\frac{40}{41}$$

$$\cos \theta = \frac{9}{41}$$

$$\tan \theta = -\frac{40}{9}$$

31. $(2\sqrt{2}, 8)$

$$r = \sqrt{(2\sqrt{2})^2 + 8^2}$$

$$r = \sqrt{72} = 6\sqrt{2}$$

$$\sin \theta = \frac{8}{6\sqrt{2}} = \frac{8\sqrt{2}}{12} \rightarrow \frac{2\sqrt{2}}{3}$$

$$\cos \theta = \frac{2\sqrt{2}}{6\sqrt{2}} = \frac{1}{3}$$

$$\tan \theta = \frac{8}{2\sqrt{2}} = 2\sqrt{2}$$

32. $(-3, \sqrt{3})$

$$r = \sqrt{(-3)^2 + (\sqrt{3})^2}$$

$$r = \sqrt{9+3} = \sqrt{12} = 2\sqrt{3}$$

$$\sin \theta = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2}$$

$$\tan \theta = -\frac{\sqrt{3}}{3}$$

$$\cos \theta = \frac{-3}{2\sqrt{3}} = -\frac{3\sqrt{3}}{6} = -\frac{\sqrt{3}}{2}$$

Given is one of the trigonometric functions and some extra information. Use the information to find the other two trigonometric functions of the angle.

33. $\sin \theta = \frac{4}{5}$; θ is in Q1

Q1 means cos is positive
 $5^2 - 4^2 = x^2$ $x = 3$

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

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

34. $\cos \theta = -\frac{12}{13}$; θ is in Q2

Q2 means sin is positive
 $13^2 - 12^2 = y^2$ $y = 5$

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

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

35. $\tan \theta = \frac{7}{24}$; θ is in Q3

Q3 means cos and sin negative
 $r^2 = 7^2 + 24^2$ $r = 25$

$\sin \theta = -\frac{7}{25}$ $\cos \theta = -\frac{24}{25}$

36. $\sin \theta = -\frac{\sqrt{3}}{2}$; θ is in Q4

Q4 cos is positive
 $2^2 - (\sqrt{3})^2 = x^2$ $x = 1$

$\cos \theta = \frac{1}{2}$

$\tan \theta = -\sqrt{3}$

37. $\cos \theta = \frac{1}{2}$; $\tan \theta > 0$

$r = 2$
 $y = \sqrt{3}$

in Q1
 $\sin \theta = \frac{\sqrt{3}}{2}$

$\tan \theta = \sqrt{3}$

\tan positive is Q1
 but $\cos \theta = \frac{1}{2}$
 is Q1 only
 not

38. $\tan \theta = \frac{2}{\sqrt{5}}$; $\sin \theta > 0$ Q1 and Q2

positive in

$x = \sqrt{5}$ $r = 3$
 $y = 2$

$\sin \theta = \frac{2}{3}$

$\cos \theta = \frac{\sqrt{5}}{3}$

39. $\sin \theta = -\frac{3}{\sqrt{10}}$; $\cos \theta < 0$ Q2 and Q3

$$r = \sqrt{10}$$

$$x = -1$$

$$y = -3$$

$$\cos \theta = \frac{-1}{\sqrt{10}}$$

$$\tan \theta = 3$$

40. $\cos \frac{3}{\sqrt{13}}$; $\tan \theta < 0$ Q2 and Q4

positive so

$$r = \sqrt{13}$$

$$x = 3$$

$$y = -2$$

$$\sin \theta = \frac{-2}{\sqrt{13}}$$

$$\tan \theta = -\frac{2}{3}$$

41. $\tan \theta = -1$; $\sin \theta < 0$ Q3 and Q4

$$x = 1$$

$$y = -1$$

$$r = \sqrt{2}$$

$$\sin \theta = \frac{-1}{\sqrt{2}}$$

$$\cos \theta = \frac{1}{\sqrt{2}}$$

42. $\sin \theta = \frac{\sqrt{15}}{4}$

$$r = 4$$

$$y = \sqrt{15}$$

$$x = \pm 1 \text{ (no quadrant given)}$$

$$\cos \theta = \pm \frac{1}{4}$$

$$\tan \theta = \pm \sqrt{15}$$

Given is the value of one of the trigonometric functions and some extra information. Use the information to find the other two trigonometric functions of the angle. Round answers to three decimal places

43. $\sin \theta = 0.642$; θ is in Q1

$$y = 0.642$$

$$r = 1$$

$$\sqrt{1 - 0.642^2} = x^2$$

Q1 cos is +

$$x = 0.767$$

$$\cos \theta = 0.767$$

$$\tan \theta = \frac{0.642}{0.767} = 0.837$$

44. $\cos \theta = 0.537$; θ is in Q4

$$x = 0.537$$

$$y = -0.844$$

$$r = 1$$

Q4 sin is -

$$\sin \theta = -0.844$$

$$\tan \theta = \frac{-0.844}{0.537} = -1.57$$

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45. $\tan \theta = 2$; θ is in Q3

$y = -2$

$x = -1$

$r = \sqrt{5}$

sin is -

cos is -

$$\sin \theta = \frac{-2}{\sqrt{5}} = -0.894$$

$$\cos \theta = \frac{-1}{\sqrt{5}} = -0.447$$

46. $\sin \theta = 0.237$; θ is in Q2

$y = 0.237$

$x = 0.972$

$r = 1$

cos is neg

$$\cos \theta = -0.972$$

$$\tan \theta = -0.244$$

47. $\cos \theta = -0.378$; $\sin \theta > 0$

$x = -0.378$

$r = 1$

$y = 0.926$

$\sin \theta = 0.926$

$\tan \theta = -2.450$

48. $\tan \theta = -1.413$; $\cos \theta > 0$

cos is + so sin is neg

$x = 1$

$y = -1.413$

$r = 1.731$

$$\sin \theta = \frac{-1.413}{1.731} = -0.816$$

$$\cos \theta = \frac{1}{1.731} = 0.578$$

49. $\sin \theta = -0.753$; $\tan \theta > 0$

$y = -0.753$

$x = -0.658$

$r = 1$

Q1 or Q3

$\cos \theta = -0.658$

$\tan \theta = 1.144$

50. $\cos \theta = -0.492$; $\sin \theta > 0$

$y = 0.871$

$x = -0.492$

$r = 1$

Q1 or 2

$\sin \theta = 0.871$

$\tan \theta = -1.770$

Extra Work Space