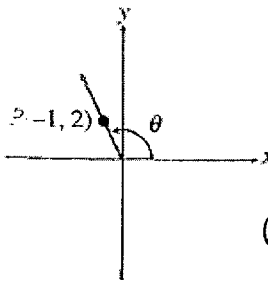
In exercises 1-2, identify the angle that is not coterminal with all the others.

1. $150°, 510°, -210°, 450°, 870°$

2. $\frac{5\pi}{3}, -\frac{5\pi}{3}, \frac{11\pi}{3}, -\frac{7\pi}{3}, \frac{365\pi}{3}$

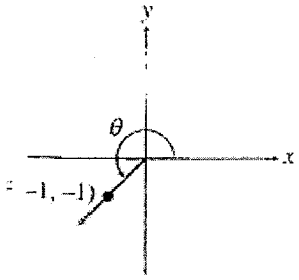
In exercises 3-4, evaluate the six trig functions of the angle θ.

3.



$\sin\theta = \frac{2}{\sqrt{5}}$
$\cos\theta = \frac{-1}{\sqrt{5}}$
$\tan\theta = -2$
$\csc\theta = \frac{\sqrt{5}}{2}$
$\sec\theta = -\sqrt{5}$
$\cot\theta = -\frac{1}{2}$

4.



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

In exercises 5-7, point P is on the terminal side of angle θ. Evaluate the six trig functions for θ. If the function is undefined, write "undefined".

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

6. P(0, 5)
$\sin\theta = 1$ $\csc\theta = 1$
$\cos\theta = 0$ $\sec\theta =$ undef
$\tan\theta =$ undef. $\cot\theta = 0$

7. P(5, -2)
$\sin\theta = -\frac{2}{\sqrt{29}}$ $\csc\theta = -\frac{\sqrt{29}}{2}$
$\cos\theta = \frac{5}{\sqrt{29}}$ $\sec\theta = \frac{\sqrt{29}}{5}$
$\tan\theta = -\frac{2}{5}$ $\cot\theta = -\frac{5}{2}$

In exercises 8-11, state the sign (+ or -) of (a) sin*t*, (b) cos*t*, and (c) tan*t* for values of *t* in the interval given.

8. $\left(0, \frac{\pi}{2}\right)$ a) + b) + c) +

9. $\left(\frac{\pi}{2}, \pi\right)$ a) + b) − c) −

10. $\left(\pi, \frac{3\pi}{2}\right)$ a) − b) − c) +

11. $\left(\frac{3\pi}{2}, 2\pi\right)$ a) − b) + c) −

In exercises 12-15, determine the sign (+ or -) of the given value without the use of a calculator.

12. $\cos 143°$ −

13. $\tan 192°$ +

14. $\cos\frac{7\pi}{8}$ −

15. $\tan\frac{4\pi}{5}$ −

In exercises 16-17, choose the point on the terminal side of θ.

16. $\theta = 45°$ A. $(2,2)$ B. $(1,\sqrt{3})$ C. $(\sqrt{3},1)$

17. $\theta = \frac{7\pi}{6}$ A. $(-\sqrt{3},-1)$ B. $(-1,\sqrt{3})$ C. $(-\sqrt{3},1)$

In exercises 18-29, evaluate without using a calculator by using ratios in a reference triangle.

18. $\cos 120°$ $-\frac{1}{2}$

19. $\tan 300°$ $-\sqrt{3}$

20. $\sec\frac{\pi}{3}$ 2

21. $\csc\frac{3\pi}{4}$ $\sqrt{2}$

22. $\sin\frac{13\pi}{6}$ $\frac{1}{2}$

23. $\cos\frac{7\pi}{3}$ $\frac{1}{2}$

24. $\tan\left(-\frac{15\pi}{4}\right)$ 1

25. $\cot\frac{13\pi}{4}$ 1

26. $\cos\frac{23\pi}{6}$ $\frac{\sqrt{3}}{2}$

27. $\cos\frac{17\pi}{4}$ $\frac{\sqrt{2}}{2}$

28. $\sin\frac{11\pi}{3}$ $-\frac{\sqrt{3}}{2}$

29. $\cot\frac{19\pi}{6}$ $\sqrt{3}$

In exercises 30-32, find (a) sin θ, (b) cos θ, and (c) tan θ for the given quadrantal angle. If the value is undefined, write "undefined".

30. $-450°$
a) -1
b) 0
c) undef.

31. 7π
a) 0
b) -1
c) 0

32. $-\frac{7\pi}{2}$
a) 1
b) 0
c) undef.

In exercises 33-35, evaluate without using a calculator.

33. Find $\sin\theta$ **and** $\tan\theta$ **if** $\cos\theta = \frac{2}{3}$ **and** $\cot\theta > 0$. $\sin\theta = \frac{\sqrt{5}}{3}$ $\tan\theta = \frac{\sqrt{5}}{2}$

35. Find $\tan\theta$ **and** $\sec\theta$ **if** $\sin\theta = -\frac{2}{5}$ **and** $\cos\theta > 0$. $\tan\theta = \frac{-2}{\sqrt{21}}$ $\sec\theta = \frac{5}{\sqrt{21}}$

36. Find $\sec\theta$ **and** $\csc\theta$ **if** $\cot\theta = -\frac{4}{3}$ **and** $\cos\theta < 0$.

$\sec\theta = -\frac{5}{4}$ $\csc\theta = \frac{5}{3}$