GO COUGARS!

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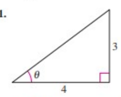
Homework Questions

In Exercises 1 and 2, use the figure to find the exact value of each trigonometric function.

1.



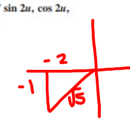
(a) $\sin\theta$ (b) $\cos\theta$
(c) $\cos 2\theta$ (d) $\sin 2\theta$
(e) $\tan 2\theta$ (f) $\sec 2\theta$
(g) $\csc 2\theta$ (h) $\cot 2\theta$

In Exercises 3–12, use a graphing utility to approximate the solutions of the equation in the interval $[0, 2\pi)$. If possible, find the exact solutions algebraically.

3. $\sin 2x - \sin x = 0$ **4.** $\sin 2x + \cos x = 0$
5. $4 \sin x \cos x = 1$ **6.** $\sin 2x \sin x = \cos x$
7. $\cos 2x - \cos x = 0$ **8.** $\tan 2x - \cot x = 0$
9. $\sin 4x = -2 \sin 2x$ **10.** $(\sin 2x + \cos 2x)^2 = 1$
11. $\cos 2x + \sin x = 0$ **12.** $\tan 2x - 2 \cos x = 0$

In Exercises 13–18, find the exact values of $\sin 2u$, $\cos 2u$, and $\tan 2u$ using the double-angle formulas.

13. $\sin u = \frac{3}{5}$, $0 < u < \pi/2$
14. $\cos u = -\frac{2}{7}$, $\pi/2 < u < \pi$
15. $\tan u = \frac{1}{2}$, $\pi < u < 3\pi/2$ →
16. $\cot u = -6$, $3\pi/2 < u < 2\pi$
17. $\sec u = -\frac{5}{2}$, $\pi/2 < u < \pi$
18. $\csc u = 3$, $\pi/2 < u < \pi$



sin2u: $2\sin u\cos u$; $2\left(-\frac{1}{\sqrt5}\right)\left(-\frac{2}{\sqrt5}\right)$; $\frac{4}{5}$

cos2u: $\cos^2 u - \sin^2 u$; $\left(\frac{-2}{\sqrt5}\right)^2 - \left(-\frac{1}{\sqrt5}\right)^2$; $\frac{4}{5} - \frac{1}{5}$; $\frac{3}{5}$

tan2u: $\dfrac{\frac{4}{\cancel{5}}}{\frac{3}{\cancel{5}}}$; $\frac{4}{3}$

In Exercises 19–22, use a double-angle formula to rewrite the expression. Use a graphing utility to graph both expressions to verify that both forms are the same.

19. $8 \sin x \cos x$

$4(2\sin x\cos x)$

$4\sin 2x$

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Homework Questions

49. $2 \sin^2 x + 3 \sin x + 1 = 0$
50. $2 \sec^2 x + \tan^2 x - 3 = 0$
51. $4 \sin^2 x = 2 \cos x + 1$
52. $\csc^2 x = 3 \csc x + 4$

53. $\csc x + \cot x = 1$
54. $4 \sin x = \cos x - 2$
55. $\dfrac{\cos x \cot x}{1 - \sin x} = 3$
56. $\dfrac{1 + \sin x}{\cos x} + \dfrac{\cos x}{1 + \sin x} = 4$

In Exercises 57–60, (a) use a graphing utility to graph each function in the interval $[0, 2\pi)$, (b) write an equation whose solutions are the points of intersection of the graphs, and (c) use the *intersect* feature of the graphing utility to find the points of intersection (to four decimal places).

57. $y = \sin 2x$, $y = x^2 - 2x$
58. $y = \cos x$, $y = x + x^2$
59. $y = \sin^2 x$, $y = e^x - 4x$
60. $y = \cos^2 x$, $y = e^{-x} + x - 1$

In Exercises 61–72, solve the multiple-angle equation.

61. $\cos \dfrac{x}{4} = 0$ **62.** $\sin \dfrac{x}{2} = 0$
63. $\sin 4x = 1$ **64.** $\cos 2x = -1$
65. $\sin 2x = -\dfrac{\sqrt{3}}{2}$ **66.** $\sec 4x = 2$
67. $2 \sin^2 2x = 1$ **68.** $\tan^2 3x = 3$
69. $\tan 3x(\tan x - 1) = 0$ **70.** $\cos 2x(2 \cos x + 1) = 0$
71. $\cos \dfrac{x}{2} = \dfrac{\sqrt{2}}{2}$ **72.** $\tan \dfrac{x}{3} = 1$

In Exercises 77–84, use a graphing utility to approximate the solutions of the equation in the interval $[0, 2\pi)$.

77. $2 \cos x - \sin x = 0$
78. $2 \sin x + \cos x = 0$
79. $x \tan x - 1 = 0$
80. $2x \sin x - 2 = 0$
81. $\sec^2 x + 0.5 \tan x = 1$
82. $\csc^2 x + 0.5 \cot x = 5$
83. $12 \sin^2 x - 13 \sin x + 3 = 0$
84. $3 \tan^2 x + 4 \tan x - 4 = 0$

In Exercises 85–88, use a graphing utility to approximate the solutions (to three decimal places) of the equation in the given interval.

85. $3 \tan^2 x + 5 \tan x - 4 = 0$, $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
86. $\cos^2 x - 2 \cos x - 1 = 0$, $[0, \pi]$
87. $4 \cos^2 x - 2 \sin x + 1 = 0$, $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$
88. $2 \sec^2 x + \tan x - 6 = 0$, $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

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Workday

More 5.1-5.3

Workbook p 134 2-14 even, 18-22, 25

Workbook p135-136 circled problems

#2 $\tan x(\cot x + \tan) = \sec^2 x$

5.1 Simplifying Trig Expressions
- Pythagorean Identities
- reciprocal Identities $\cos\theta = \frac{1}{\sec\theta}$ $\sec\theta = \frac{1}{\cos\theta}$, etc
- quotient Identities $\tan\theta = \frac{\sin\theta}{\cos\theta}$ $\cot\theta = \frac{\cos\theta}{\sin\theta}$
- reduce the expression to simplest terms

5.2 Verify Trig Equations
- same info as above
- make one side look like the other

5.3 solving trig equations
- get trig function alone or factored
- solve for x

$[0, 2\pi)$

$(-\infty, \infty)$ add $2k\pi$, $k\pi$, $\frac{\pi k}{2}$

- multi angle problems

get mutiple by creating groups of solutions

ie ($\sin 3x = 0$)

└ by 2π to each set

- divide by the coefficient in front of x

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