2.4 The Chain Rule Name _____

Differentiate the following:

7. $(2x-7)^3$

12. $\sqrt{5-3x}$

14. $\sqrt{x^2-2x+1}$

15. $\sqrt{\dfrac{x}{1-x}}$

22. $\dfrac{1}{\sqrt{x^2-2}}$

23. $f(x)=x^2(x-2)^4$

24. $f(x)=x(3x-9)^3$

27. $y=\dfrac{x}{\sqrt{x^2+1}}$

28. $y=\dfrac{x}{\sqrt{x^4+4}}$

30. $h(t)=\left(\dfrac{t^2}{t^3+2}\right)^2$

32. $g(x)=\left(\dfrac{3x^2-2}{2x+3}\right)^3$

41. $y=\cos 3x$

42. $y=\sin \pi x$

44. $h(x)=\sin^2 x$

47. $h(x)=\sin 2x\cos 2x$

52. $g(t)=5\cos^2 \pi t$

53. $f(x)=\dfrac{1}{4}\sin^2 2x$

Evaluate the derivative of the function at the given point.

59. $s(t)=\sqrt{t^2+2t+8}\quad (2,4)$

61. $f(x)=\dfrac{3}{x^3-4}\qquad \left(-1,\dfrac{-3}{5}\right)$

62. $f(x)=\dfrac{1}{(x^2-3x)^2}\qquad \left(4,\dfrac{1}{16}\right)$

63. $f(t)=\dfrac{3t+2}{t-1}\qquad (0,-2)$

Find an equation of the tangent line to the graph of *f* at the given point.

67. $f(x)=\sqrt{3x^2-2}\qquad (3,5)$

69. $y=(2x^3+1)^2\qquad (-1,1)$

71. $y=\sin 2x\qquad (\pi,0)$

Find the second derivative of the function.

83. $f(x)=2(x^2-1)^3$

85. $f(x)=\sin x^2$

84. $f(x)=\dfrac{1}{x-2}$

86. $f(x)=\left(\dfrac{1}{x-3}\right)^3$