The Chain Rule

In problems 1-8, Use the general power rule to find the derivative of the function.

1. $f(x)=(3x-5)^4$	2. $f(x)=(x^2+4x)^{4/3}$
3. $f(x)=(x^3-x^2-7)^3$	4. $f(x)=\sqrt{11x-2}$
5. $f(x)=\sqrt{3x^2-8x+1}$	6. $f(x)=\sqrt[5]{x^2-3}$
7. $f(x)=\dfrac{5}{(7x+2)^4}$	8. $f(x)=\dfrac{-3}{\sqrt[5]{(5-x^2)^6}}$

In problems 9-11, Find an equation of the tangent line to the graph of f at the given point.

9. $f(x)=(4x+6)^3,\ (-1,8)$	10. $f(x)=\sqrt{7x+2},\ (1,3)$
11. $f(x)=\sqrt{x^2-7x+37},\ (3,5)$	

In problems 12-16, Find the derivative of the function.

12. $y=\dfrac{3}{4x^2-3}$	13. $f(x)=\dfrac{8}{(5x+1)^7}$
14. $f(x)=(x^2-4x)(5x+2)$	15. $f(x)=\dfrac{3}{\sqrt{9x-1}}$
16. $f(x)=4x(7x-2)^6$	

In problems 17-18, Find an equation of the tangent line to the graph of f at the given point.

17. $f(x)=\dfrac{16}{(8+2x)^3},\ (-3,2)$	18. $f(x)=\sqrt[3]{x^2-4x+11},\ (1,2)$

19. $5000 is put into an account with an annual interest rate of r compounded monthly. At the end of 10 years, the balance A is

$$A=5000\left(1+\frac{r}{12}\right)^{120}$$

Find the rate of change of A with respect to r when

(a) r = 0.05, (b) r = 0.10, and (c) r = 0.15

The Chain Rule

20. The value V of a machine t years after it is purchased is inversely proportional to the square root of t + 3. The initial value of the machine is $5000.

(a) Write V as a function of t

(b) Find the rate of depreciation when t = 1

(c) Find the rate of depreciation when t = 5