Derivatives P-Set

Find the average rate of change of each function as other x-values get closer to the given x-value.

1. $f(x) = x^2 + x + 4$; $x = 3$
2. $f(x) = -x^3 + 10x^2$; $x = 1$

Find the average rate of change for each function. *Hint*: $(x + h)^3 = x^3 + 3hx^2 + 3h^2x + h^3$.

3. $f(x) = 5x$
4. $f(x) = -3x$
5. $f(x) = 6x + 2$
6. $f(x) = 3x^2$
7. $f(x) = -2x^3 + 1$
8. $f(x) = \frac{1}{2}x^2 + x$

Find the derivative of each function.

9. $f(x) = 5x$
10. $f(x) = -3x$
11. $f(x) = 6x + 2$
12. $f(x) = 3x^2$
13. $f(x) = -2x^3 + 1$
14. $f(x) = \frac{1}{2}x^2 + x$

Using your answers from above, find the each of the following.

15. $f'(1)$ from problem **??**
16. $f'(2)$ from problem **??**
17. $f'(-1)$ from problem **??**
18. $f'(0)$ from problem **??**
19. $f'(3)$ from problem **??**
20. $f'(-2)$ from problem **??**

Key

1. 7
2. 17
3. 5
4. -3
5. 6
6. $6x + 3h$
7. $-6x^2 - 6hx - 2h^2$
8. $x + \frac{1}{2}h + 1$
9. $f'(x) = 5$
10. $f'(x) = -3$
11. $f'(x) = 6$
12. $f'(x) = 6x$
13. $f'(x) = -6x^2$
14. $f'(x) = x + 1$
15. 5
16. -3
17. 6
18. 0
19. -54
20. -1