

Algebra for Calculus Difference Quotient

For each of the following functions, find the

difference quotient $\frac{f(x+h)-f(x)}{h}$

1. $f(x) = x^2$

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

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

4. $f(x) = x^2 - x - 3$

5. $f(x) = 5x^2 + x - 4$

6. $f(x) = 2x^2 - x$

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

8. $f(x) = 4x^2 - x + 3$

9. $f(x) = 6x^2 - x + 5$

10. $f(x) = 2x^2 - x + 11$

11. $f(x) = x^3$

12. $f(x) = x^3 + 2$

13. $f(x) = 2x^3$

14. $f(x) = 2x^3 - 3$

15. $f(x) = x^3 + 1$

16. $f(x) = x^3 + x + 1$

17. $f(x) = \frac{3x}{x+1}$

18. $f(x) = \frac{x-4}{x+1}$

19. $f(x) = \frac{x-4}{x+3}$

20. $f(x) = \frac{x-3}{x+2}$

Answers:

1. $2x+h$
2. $2x+h-3$
3. $2x+h-2$
4. $2x$
5. $10x+5h+1$
6. $4x+2h-1$
7. $6x+3h-2$
8. $8x+4h-1$
9. $12x+6h-1$
10. $4x+2h-1$

11. $3x^2+3xh+h^2$
12. $3x^2+3xh+h^2$
13. $6x^2+6xh+2h^2$
14. $6x^2+6xh+2h^2$
15. $3x^2+3xh+h^2$
16. $3x^2+3xh+h^2+1$