

## Difference Quotient Practice

Find the difference quotient  
for the following functions:

1.  $y = 9x^2 - 7x + 6$

2.  $y = 8x^2 - 4$

3.  $y = 2x + 7$

Solution 4

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

1) 
$$\frac{9(x+h)^2 - 7(x+h) + 6 - (9x^2 - 7x + 6)}{h}$$

$$\frac{9(x^2 + 2xh + h^2) - 7x - 7h + 6 - 9x^2 + 7x - 6}{h}$$

$$\frac{9x^2 + 18xh + 9h^2 - 7x - 7h + 6 - 9x^2 + 7x - 6}{h}$$

$$\frac{18xh + 9h^2 - 7h}{h}$$

$$\boxed{18x + 9h - 7}$$

2. 
$$\frac{8(x+h)^2 - 4 - (8x^2 - 4)}{h}$$

$$\frac{8(x^2 + 2xh + h^2) - 4 - 8x^2 + 4}{h}$$

$$\frac{8x^2 + 16xh + 8h^2 - 4 - 8x^2 + 4}{h}$$

$$\frac{16xh + 8h^2}{h} = \boxed{16x + 8h}$$

3. 
$$\frac{2(x+h) + 7 - (2x + 7)}{h}$$

$$\frac{2x + 2h + 7 - 2x - 7}{h}$$

$$\frac{2h}{h} = \boxed{2}$$