Practice worksheet | Introduction to calculus

Instantaneous rates and limiting secants

Name: _____ Date: _____

6 questions | 18 marks

1. Use a difference quotient for $f(x) = x^2$ at 1. [3 marks]

2. Use a difference quotient for $f(x) = 3x^2$ at 2. [3 marks]

3. Find the gradient of $f(x) = x^3$ at 1 using its difference quotient. [3 marks]

4. For $f(x) = x^2$ at 2, calculate secant gradients for $h = 1, 0.1, 0.01$ and state the limiting value. [3 marks]

5. For $f(x) = |x|$ at 0, compare the left and right difference quotients. Does one derivative exist? [3 marks]

6. $s(t) = 5t^2$ metres. Use a limiting quotient to find velocity at 3 seconds. [3 marks]