5. [7 points]

a. [3 points] Let

$$Q(t) = 7 - \sin(t^2).$$

Suppose k is a nonzero constant. Write an explicit expression for the average rate of change of Q between $t = 5$ and $t = 5 + k$.
Your answer should not involve the letter Q. Do not attempt to simplify your expression.

Draw a box around your final answer.

Solution:

$$\frac{7 - \sin\left((5+k)^2\right) - \left(7 - \sin(5^2)\right)}{k}$$

b. [4 points] Let

$$P(w) = 6^{\arctan(4w)}.$$

Use the limit definition of the derivative to write an explicit expression for $P'(-3)$.
Your answer should not involve the letter P. Do not attempt to evaluate or simplify the limit.

Draw a box around your final answer.

Solution:

$$\lim_{h \to 0} \frac{6^{\arctan(4(-3+h))} - 6^{\arctan(4(-3))}}{h}$$