Quiz 6

104) $P'(x) = 2x \cdot Q(x) + x^2 \cdot Q'(x)$ by the Product Rule

$P'(3) = 2(3) \cdot Q(3) + (3)^2 \cdot Q'(3)$

$P'(3) = 6 \cdot Q(3) + 9 \cdot Q'(3)$

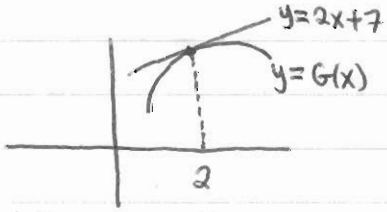
$P'(3) = 6(5) + 9(-6)$

$P'(3) = 30 - 54 = \boxed{-24}$

106) $\left[\dfrac{G(x)}{x}\right]' = \dfrac{x \cdot G'(x) - G(x) \cdot (1)}{x^2}$ by the quotient rule.

Plug in $x=2$ to get $\dfrac{2 \cdot G'(2) - G(2)}{4}$

In order to evaluate this we need to know $G(2)$ and $G'(2)$



Looking at this picture we see that the function G and the tangent line have the same height at $x=2$. This means $G(2) = 2(2) + 7 = 11$
Also the slope of the tangent line and the slope of the function G are the same at $x=2$. This means $G'(2) = 2 = m$.

Now $\dfrac{2 \cdot G'(2) - G(2)}{4} = \dfrac{2 \cdot 2 - 11}{4} = \boxed{\dfrac{-7}{4}}$

107) $\left[\frac{w(x)}{x}\right]' = \frac{x \cdot w'(x) - w(x) \cdot (1)}{x^2}$ by the Quotient Rule

given

Plug in $x = 2$ and set equal to 4 to get:

$$\frac{(2)w'(2) - w(2)}{2^2} = 4$$

This implies that $2w'(2) - w(2) = 16$

We are given that $w(2) = 6$ so $2w'(2) - 6 = 16$.

This implies that $w'(2) = \boxed{11.}$