ASSIGNMENT: Finding the Equations of Tangents
DIRECTIONS: In order to find the equation of a tangent line, first you need to find the slope at a specific point on the curve by utilizing the derivative and inputting the x-value at your point.
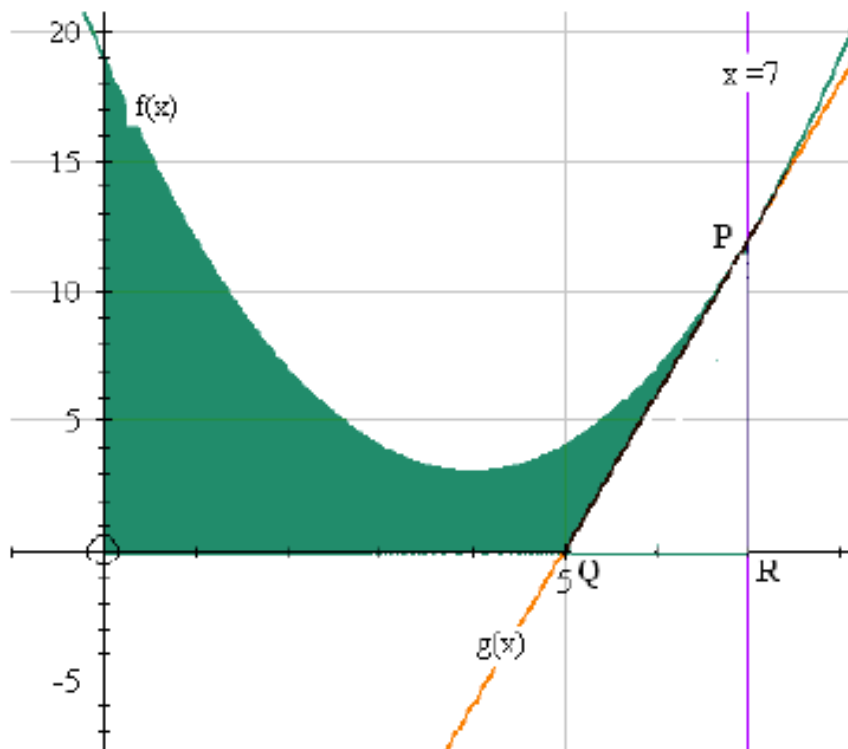
Now you have the gradient of the tangent line.

Next, input this information into either the point-slope or slope-intercept formula.

y = mx + b = ax + b (Slope Intercept)   OR   y – y₁ = m(x – x₁) [Point- Slope]

1.)   *[SL non-calc]*

The graph of the function $f(x) = (x-4)^2 + 3$ and its tangent $g(x)$.

(a) Find $f'(x)$

[2 marks]

(b) Hence find the gradient of the function $f(x)$ at $x = 7$ and also find the equation of the tangent at (7,12)

[3 marks]

2.) The Blue Angels are the US Navy's flight demonstration squadron featuring pilots from both the Navy and Marines. Utilizing a computer simulator, the pilots decide on a course modeled by the function

$$f(x) = \cos(2x^2)\, e^{2x}$$

Where x is time in seconds and $f(x)$ is height in meters.

Find the equation of the tangent line at 0 seconds so that the pilots can understand their instantaneous rate of change.   *[SL non-calc]*

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3.) Create your own quadratic function and find the equation of the tangent line at any point you desire.

Your quadratic function: _____

Derivative: _____

Selected input value: _____

Gradient of the tangent at that point: _____

Output value for selected input value: _____

Equation of tangent line at that point: _____

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Answer key (you must show all calculations for credit):

1) y = 6x – 30
2) g(x) = 2x + 1
3) Have fun!