MA 137 Worksheet #13

Sections 4.3 & 4.4
9/29/20

1. Write out the following rules of differentiation and give an example of an instance where you might use them:

1. constant rule
2. constant multiple rule
3. sum rule
4. power rule
5. product rule
6. quotient rule

NOTE: The quotient rule comes from the power rule and product rule if you consider the chain rule in the calculation of the negative power derivative. When you learn about the chain rule, try to figure out how this works.

2. Find $f'(x)$ for the following functions using the rules above. Make sure to label which rules you are using at each step:

1. $$f(x) = x^3 - 5x^4 + 32$$
2. $$f(x) = \pi^4 - \frac{17}{x^{3/2}}$$
3. $$f(x) = (x^7 + 6x - 1)(3x^{1/2} + 5x^3 + 2 - 12x)$$
4. $$f(x) = \frac{(2+3x)^2}{4 - x^2}$$

3. Find the following values if $f(7) = a^2$, $f'(7) = ab^3$, $g(7) = a^2b$, and $g'(7) = ab$:

1. $h'(7)$ for $h(x) = f(x)g(x)$
2. $h'(7)$ for $h(x) = f(x)/g(x)$
3. $h'(7)$ for $h(x) = f(x)g(x) - 6/f(x)$