Calculus practice

This is solely for your practice with calculus. I will grade more tricky derivatives in future homeworks!

Answers are on the next page.

\[ f(x) = 7x^3 + 4x - 8 \]
Find \( f'(x) \) \quad Find \( f'(3) \)

\[ g(x) = x^8 - 15x^2 + 42 \]
Find \( g'(x) \) \quad For what \( x \) values does \( g'(x) = 0? \)

\[ h(x) = 22 \log(x) \]
Find \( h'(x) \)

\[ r(x) = \frac{10}{x^2 + 3x} \]
Find \( r'(x) \) \quad Find \( r'(2) \)
Calculus answers:

f(x) = 7x^3 + 4x - 8  
Find f'(x)  
Find f'(3)  
\[ 21x^2 + 4 \]  
\[ 21 \times 9 + 4 = 189 + 4 = 193 \]

g(x) = x^8 - 15x^2 + 42  
Find g'(x)  
For what x values does g'(x) = 0?  
\[ 8x^7 - 30x \]  
\[ 80x^7 - 30x = 0 \rightarrow x = 0 \text{ or } x = \left( \frac{3}{8} \right)^{1/6} \]

h(x) = 22 \log(x)  
Find h'(x)  
\[ \frac{22}{x} \]

r(x) = \frac{10}{x^2 + 3x}  
Find r'(x)  
Find r'(2)  
\[ -\frac{10(2x + 3)}{(2x^2 + 3x)^2} \]  
\[ -\frac{10(4 + 3)}{(2 \times 4 + 6)^2} = \frac{-70}{14^2} = \frac{-70}{196} \]

take derivative of (x^2 + 3x), multiply by derivative of \( \frac{10}{y} \) and insert (2x^2 + 3x) for y