

CALCULUS
The quotient rule
OLD2

0350-1. Differentiate $f(x) = (5x^3 - 9x^2 - 4)e^x$.

0350-2. Differentiate $u = \frac{5x^3 - 9x^2 - 4}{e^x}$.

0350-3. Differentiate $F(s) = \left(\frac{(5/e^s) + 4}{s^3 + 4s^5} \right) \left(\frac{2s + 4}{s^2 e^s} \right)$.

0350-4. Differentiate $G(u) = e^{1-u}$.
Hint: $e^{1-u} = e/e^u$.

0350-5. Differentiate $H(v) = e^{4+2v}$.
Hint: $e^{4+2v} = e^4(e^v)(e^v)$.

0350-6. Differentiate $y = \sqrt{\pi}(x^4 + 2x)e^{2x}$.

0350-7. Find an equation of the tangent line
to $y = \frac{7x + 1}{2x + 2}$ at $(1, 2)$.

0350-8. Find an equation of the tangent line
to $y = (x^4 + x + 1)e^x$ at $(0, 1)$.

0350-9. Find an equation of the tangent line
to $y = (x^4 + x + 1)e^{-x}$ at $(0, 1)$.

0350-10. Say $f(7) = 9$ and $f'(7) = 6$.

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Say $h(7) = 3$ and $h'(7) = 5$.

Let $g(x) = \frac{f(x)}{h(x)}$. Compute $g(7)$ and $g'(7)$.

Let $u(x) = [f(x)] [h(x)]$.

Compute $u(7)$ and $u'(7)$.

0350-11. Say $q(3) = -2$ and $q'(3) = 7$.

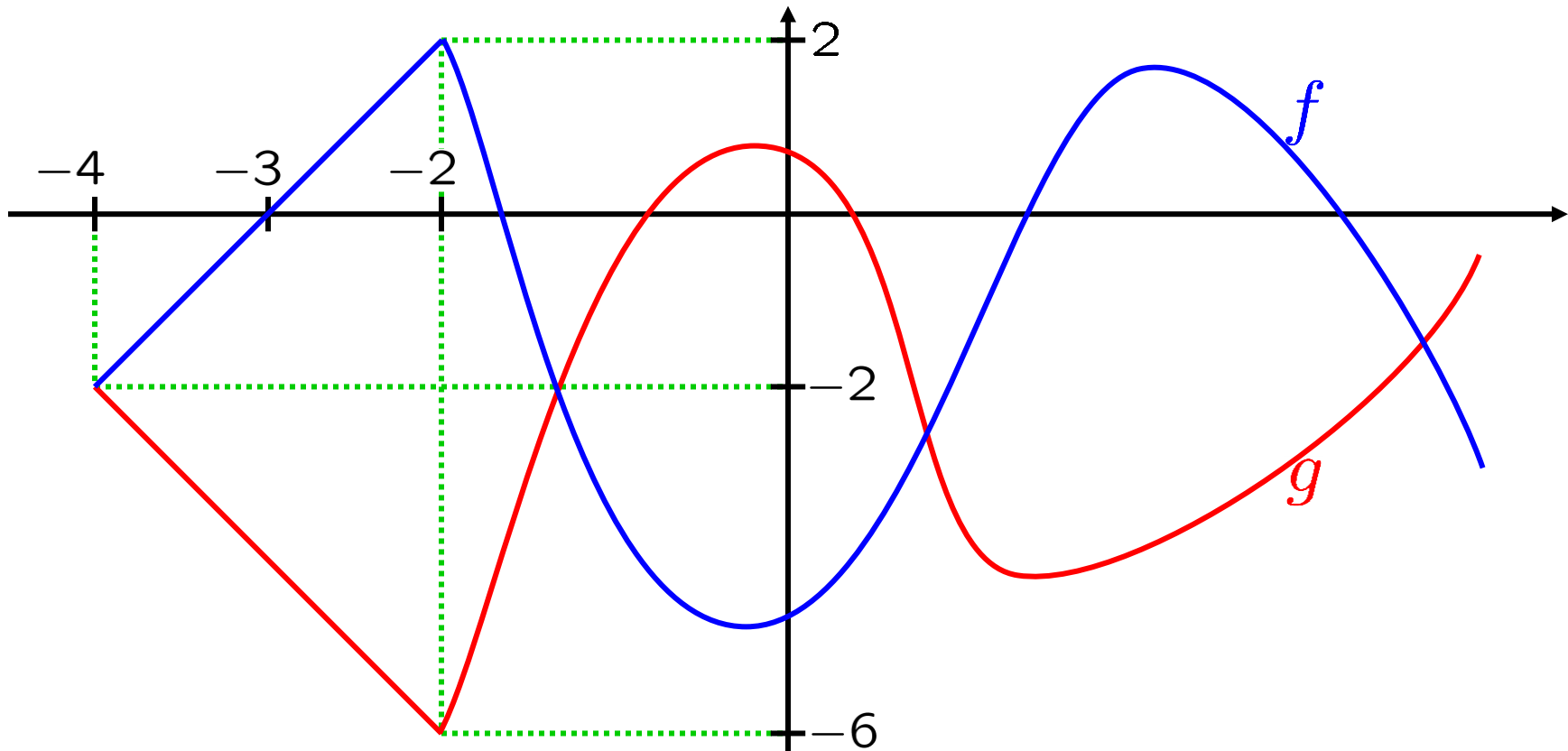
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a. Compute $\left[\frac{d}{dt} \left(e^{2t} (q(t)) \right) \right]_{t \rightarrow 3}$.

b. Compute $\frac{d}{dt} \left(\left[e^{2t} (q(t)) \right]_{t \rightarrow 3} \right)$.

0350-12. The graphs of f and g are shown below.

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a. Find $\left[\frac{d}{dt} ([f(t)][g(t)]) \right]_{t \rightarrow -3}$.

c. Find $\frac{d}{dt} \left([[f(t)][g(t)]]_{t \rightarrow -3} \right)$.

b. Find $\left[\frac{d}{dt} \left(\frac{f(t)}{g(t)} \right) \right]_{t \rightarrow -3}$.

d. Find $\frac{d}{dt} \left(\left[\frac{f(t)}{g(t)} \right]_{t \rightarrow -3} \right)$.

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