Homework 32a

Name: Solution

Evaluate each expression. Calculators are **not** allowed.
At least 9 must be correct for any credit. Allowed time: 10 minutes.

1. $\frac{d}{dx}(3x^3 + 5x^2 - 8x + 2) = \boxed{9x^2 + 10x - 8}$

2. $\frac{d}{dx}(7e^{-3x}) = 7e^{-3x} \cdot (-3) = \boxed{-21e^{-3x}}$

3. $\frac{d}{dx}(2\tan(8x)) = 2 \cdot \sec^2 8x \cdot 8 = \boxed{16 \sec^2 8x}$

4. $\frac{d}{dr}\Big(\ln\big(\cos(4r)\big)\Big) = \frac{(\cos 4r)'}{\cos 4r} = \frac{-4\sin 4r}{\cos 4r} = \boxed{-4\tan 4r}$

5. $\frac{d}{dy}(e^y \sin(4y)) = e^y \sin 4y + e^y \cdot \cos 4y \cdot 4 = \boxed{e^y(\sin 4y + 4\cos 4y)}$

6. $\frac{d}{dx}(-3\cos(2x)) = -3 \cdot (-\sin 2x) \cdot 2 = \boxed{6\sin 2x}$

7. $\frac{d}{ds}\left(\frac{s+2}{s^2+4}\right) = \frac{(s^2+4)\cdot 1 - 2s(s+2)}{(s^2+4)^2} = \frac{s^2+4-2s^2-4s}{(s^2+4)^2}$
(write as a fraction with simplified numerator)
$= \boxed{\frac{-s^2-4s+4}{(s^2+4)^2}}$

8. $\frac{d}{dt}(5\sin(3t)) = 5 \cdot \cos 3t \cdot 3$
$= \boxed{15\cos 3t}$

9. $\frac{d}{dt}(\tan^{-1}(4t)) = \frac{1}{1+(4t)^2} \cdot 4 = \boxed{\frac{4}{1+16t^2}}$

10. $\frac{d}{dx}(5\ln(3x)) = 5 \cdot \frac{3}{3x} = \boxed{\frac{5}{x}}$