3.5.11 When dividing by a power or a root, it's easier to use a negative exponent.

$$
\begin{aligned}
y &= \frac{1}{x^{10}} = x^{-10}; \\
\mathrm{d}y &= \mathrm{d}(x^{-10}) = -10x^{-11}\,\mathrm{d}x; \\
\frac{\mathrm{d}y}{\mathrm{d}x} &= -10x^{-11} = -\frac{10}{x^{11}}.
\end{aligned}
$$

4.4.63 Similarly,

$$
\begin{aligned}
\frac{1}{(w^3+4)^5} &= (w^3+4)^{-5}; \\
\mathrm{d}\frac{1}{(w^3+4)^5} &= -5(w^3+4)^{-6}\,\mathrm{d}(w^3+4) = -5(w^3+4)^{-6}(3w^2\,\mathrm{d}w); \\
\frac{\mathrm{d}}{\mathrm{d}w}\frac{1}{(w^3+4)^5} &= -5(w^3+4)^{-6}(3w^2) = -\frac{15w^2}{(w^3+4)^6}.
\end{aligned}
$$

4.3.39 Here I use the Product Rule:

$$
\begin{aligned}
f(x) &= (2x+1)(x^2-3x); \\
\mathrm{d}f(x) &= (x^2-3x)\,\mathrm{d}(2x+1) + (2x+1)\,\mathrm{d}(x^2-3x) = (x^2-3x)(2\,\mathrm{d}x) + (2x+1)(2x\,\mathrm{d}x - 3\,\mathrm{d}x); \\
f'(x) = \frac{\mathrm{d}f(x)}{\mathrm{d}x} &= (x^2-3x)(2) + (2x+1)(2x-3) = 6x^2 - 10x - 3.
\end{aligned}
$$

4.5.11 Differentiate, solve for $\mathrm{d}y$, and divide by $\mathrm{d}x$:

$$
\begin{aligned}
xy - 6 &= 0; \\
\mathrm{d}(xy-6) &= \mathrm{d}(0); \\
y\,\mathrm{d}x + x\,\mathrm{d}y &= 0; \\
x\,\mathrm{d}y &= -y\,\mathrm{d}x; \\
\mathrm{d}y &= -\frac{y\,\mathrm{d}x}{x}; \\
\frac{\mathrm{d}y}{\mathrm{d}x} &= -\frac{y}{x}.
\end{aligned}
$$

When $(x,y) = (2,3)$,

$$
\frac{\mathrm{d}y}{\mathrm{d}x} = -\frac{y}{x} = -\frac{3}{2}.
$$