Answers to Worksheet 8 - Derivatives III

1) $y = 7s + 5$

2) $y = \frac{1}{8}x - \frac{5}{8}$

3) $y = 3x - \frac{13}{2}$

4) $\frac{d^3t}{dr^3} = -12$

5) $\frac{d^3y}{dt^3} = -120t^2$

6) $\frac{d^3g}{dx^3} = -300x^2 - 96x$

7) $\frac{dy}{dx} = \frac{9x^2}{2y}$

8) $\frac{dy}{dx} = \frac{3x}{5y}$

9) $\frac{dy}{dx} = \frac{-6xy^2 + 1}{6x^2y}$

10) $\frac{dy}{dx} = \frac{x^2}{2y^2}$

11) $\frac{dy}{dx} = \frac{3y^2 - 6x^2}{-2y - 6yx}$

12) $\frac{dy}{ds} = \frac{12}{5s^{\frac{1}{5}}}$

13) $\frac{dh}{ds} = -\frac{1}{3s^{\frac{2}{3}}}$

14) $\frac{dr}{dx} = \frac{10}{x^6}$

15) $\frac{dy}{dx} = \left(-5 - 3x^{-2}\right) \cdot 25x^4 + \left(5x^5 - 1\right) \cdot 6x^{-3}$

$= -125x^4 - 45x^2 - \frac{6}{x^3}$

16) $\frac{dt}{dr} = \left(-2r^{\frac{1}{5}} + 5\right) \cdot -4r + \left(-2r^2 - 1\right) \cdot -\frac{2}{5}r^{-\frac{4}{5}}$

$= \frac{44r^{\frac{6}{5}}}{5} - 20r + \frac{2}{5r^{\frac{4}{5}}}$

17) $\frac{dg}{dx} = \left(5 + 2x^{-4}\right) \cdot 2x + \left(x^2 - 4\right) \cdot -8x^{-5}$

$= 10x - \frac{4}{x^3} + \frac{32}{x^5}$

18) $\frac{df}{dr} = \left(-r^{\frac{3}{5}} + 4\right) \cdot -15r^2 + \left(-5r^3 - 5\right) \cdot -\frac{3}{5}r^{-\frac{2}{5}}$

$= 18r^{\frac{13}{5}} - 60r^2 + \frac{3}{r^{\frac{2}{5}}}$

19) $\frac{dy}{ds} = \left(-4s^{\frac{1}{4}} + 2\right) \cdot -8s + \left(-4s^2 + 4\right) \cdot -s^{-\frac{3}{4}}$

$= 36s^{\frac{5}{4}} - 16s - \frac{4}{s^{\frac{3}{4}}}$