ANSWERS

1) $y = \cos^{-1}(-5x^3)$

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

2) $y = \sin^{-1}(-2x^2)$

$$\frac{dy}{dx} = \frac{1}{\sqrt{1-(-2x^2)^2}} \cdot -4x$$
$$= -\frac{4x}{\sqrt{1-4x^4}}$$

3) $y = \tan^{-1}(2x^4)$

$$\frac{dy}{dx} = \frac{1}{(2x^4)^2+1} \cdot 8x^3$$
$$= \frac{8x^3}{4x^8+1}$$

4) $y = \csc^{-1}(4x^2)$

$$\frac{dy}{dx} = -\frac{1}{|4x^2|\sqrt{(4x^2)^2-1}} \cdot 8x$$
$$= -\frac{2}{x\sqrt{16x^4-1}}$$

5) $y = (\sin^{-1} 5x^2)^3$

$$\frac{dy}{dx} = 3 \cdot (\sin^{-1} 5x^2)^2 \cdot \frac{1}{\sqrt{1-(5x^2)^2}} \cdot 10x$$
$$= \frac{30x \cdot (\sin^{-1} 5x^2)^2}{\sqrt{1-25x^4}}$$

6) $y = \sin^{-1}(3x^5+1)^3$

$$\frac{dy}{dx} = \frac{1}{\sqrt{1-((3x^5+1)^3)^2}} \cdot 3(3x^5+1)^2 \cdot 15x^4$$
$$= \frac{45x^4(3x^5+1)^2}{\sqrt{1-(3x^5+1)^6}}$$

7) $y = (\cos^{-1} 4x^2)^2$

$$\frac{dy}{dx} = 2\cos^{-1} 4x^2 \cdot -\frac{1}{\sqrt{1-(4x^2)^2}} \cdot 8x$$
$$= -\frac{16x\cos^{-1} 4x^2}{\sqrt{1-16x^4}}$$

8) $y = \cos^{-1}(-2x^3-3)^3$

$$\frac{dy}{dx} = -\frac{1}{\sqrt{1-((-2x^3-3)^3)^2}} \cdot 3(-2x^3-3)^2 \cdot -6x^2$$
$$= \frac{18x^2(-2x^3-3)^2}{\sqrt{1-(-2x^3-3)^6}}$$

1. $\frac{2}{\sqrt{1-4x^2}}$	2. $\frac{3}{1+9x^2}$	3. $\frac{2}{\sqrt{e^{4x}-1}}$	4. $\frac{1}{2\sqrt{x-x^2}}$
5. $\frac{1}{\sqrt{9-x^2}}$	6. $\frac{-2}{\sqrt{1-(2x+1)^2}}$	7. $\frac{7}{\lvert x\rvert\sqrt{x^{14}-1}}$	8. $\frac{-1}{\sqrt{e^{2x}-1}}$
9. $\frac{-1}{\lvert x\rvert\sqrt{x^2-1}}$	10. $\frac{e^x}{\lvert x\rvert\sqrt{x^2-1}} + e^x \sec^{-1} x$	11. $\frac{3x^2(\sin^{-1} x)^2}{\sqrt{1-x^2}} + 2x(\sin^{-1} x)^3$	