

① a) $f'(x) = \sin(x) + x \cdot \cos(x)$ b) $f'(x) = 3 \cdot \cos(x) - 3x \cdot \sin(x)$
 c) $f'(x) = 3 \cdot \sqrt{x} + (3x+2) \cdot \frac{1}{2\sqrt{x}}$ d) $f'(x) = 2 \cdot \sqrt{x} + (2x-3) \cdot \frac{1}{2\sqrt{x}}$
 e) $f'(x) = \frac{1}{2\sqrt{x}} \cdot \cos(x) - \sqrt{x} \cdot \sin(x)$ f) $f'(x) = (-3) \cdot \sin(x) + (5-3x) \cdot \cos(x)$

g) $f'(x) = -2x^{-2} \cdot \cos(x) - 2x^{-1} \cdot \sin(x)$ h) $f'(x) = \cos(x) \cdot \cos(x) - \sin(x) \cdot \sin(x)$
 $= -\frac{2}{x^2} \cdot \cos(x) - \frac{2}{x} \cdot \sin(x)$ i) $f'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

j) $f'(x) = -\frac{1}{2} x^{-\frac{3}{2}} \cdot \cos(x) - x^{-\frac{1}{2}} \cdot \sin(x)$ k) $f'(x) = \frac{\pi}{4} \cdot \cos(x) \cdot (2-x) - \frac{\pi}{4} \sin(x)$
 $= \frac{-1}{2\sqrt{x}} \cdot \cos(x) - \frac{1}{\sqrt{x}} \cdot \sin(x)$ l) $f'(x) = \frac{\sqrt{3}}{2\sqrt{x}}$

②

a) $f'(x) = \sin(3x) + 3x \cos(3x)$

b) $f'(x) = 6(3x+4) \cdot \sin(x) + (3x+4)^2 \cdot \cos(x)$

e) $f'(x) = -2x^{-3} (2x+5)(5-4x)^2$

g) $f'(x) = 3(\sin(x))^2 + 6x \sin(x) \cdot \cos(x)$

i) $f'(x) = x \cdot \sqrt{4-x} - \frac{x^2}{4\sqrt{4-x}}$

c) $f'(x) = \frac{-2x+3}{x^2} + \frac{2}{x}$

d) $f'(x) = \cancel{2x(5-4x)^2} + \cancel{(2x)^2}$
 $= -12(5-4x)^2 \cdot (1-4x) - 4 \cdot (5-4x)^3$

f) $f'(x) = 3 \cos(2x) - 6x \sin(2x)$

h) $f'(x) = 4\sqrt{x} (2x-1) + \frac{(2x-1)^2}{2\sqrt{x}}$