Solutions:

1. $f'(-1) = -4$.

2. $f'(x) = 6x^2$.

3. $f'(x) = -\frac{1}{2(x-4)^{3/2}}$.

4. No.

5. Differentiate the following functions.

a) $f'(x) = 12x^2$.

b) $g'(x) = -4x + 4$.

c) $h'(x) = -\frac{6}{x^3}$.

d) $f'(x) = \frac{3}{2x^{1/2}} - 2\pi x$.

e) $g'(x) = 12x^5 + 40x^3 - 6x$.

f) $h'(x) = 36x^3 + 18x^2 + 38x + 12$.

g) $f'(x) = \frac{-3x^2+2x-6}{(x^2-2)^2}$.

h) $g'(x) = \frac{2x^5(4x-3)}{(2x-1)^3}$.

i) $h'(x) = 4\cos^2(x) - 4\sin^2(x)$.

j) $h'(x) = 8\sec^2(4x)$.

k) $g'(x) = 2x\csc(2x) - 2x^2\cot(2x)\csc(2x)$.

l) $h'(x) = 9\sec^3(3x)\tan(3x)$.

m) $f'(x) = -12x\cos(3x^2)\csc^2(\sin(3x^2))$.

n) $g'(x) = -24x\cos(3x^2)\cot(\sin(3x^2))\csc^2(\sin(3x^2))$.

6. Find the equation of the line tangent to the function $y = \frac{6}{2x+1}$ at the point (1, 2).

$y = \frac{10}{3} - \frac{4}{3}x$