THE PRODUCT RULE

1 Use the product rule to find the derivative of each function.

(a) $y = (x-2)(6x+7)$ **(b)** $f(x) = (2x+1)(x+3)$ **(c)** $y = (3x+4)(x^2-2x)$

(d) $g(x) = (x-1)(x^2-3x)$ **(e)** $y = (2x^2-5x)(x-2)$ **(f)** $f(x) = (x^2-4x)(x^2+3)$

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4 For $g(x) = (x^2 + 5x)(x^3 + x^2 + 1)$, find: **(a)** $g'(x)$ **(b)** $g'(1)$ **(c)** $g'(-2)$

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5 Find $\frac{dy}{dx}$ for: **(a)** $y = \sqrt{x}(x-1)$ **(b)** $y = x\left(\sqrt{x}-1\right)$ **(c)** $y = x\left(\frac{1}{x}+1\right)$

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5 Find $\frac{dy}{dx}$ for: **(d)** $y=\left(3\sqrt{x}+1\right)\left(x^2+4\right)$ **(e)** $y=\left(x+\frac{1}{x}\right)\left(x-\frac{1}{x}\right)$ **(f)** $y=\left(x^2+\frac{2}{x}\right)\left(1+\sqrt{x}\right)$