THE QUOTIENT RULE

1 Use the quotient rule to differentiate each function.

(a) $y = \dfrac{x-1}{x+1}$ **(b)** $f(x) = \dfrac{3x-7}{4x+5}$ **(c)** $g(t) = \dfrac{2t+5}{t+2}$

THE QUOTIENT RULE

1 Use the quotient rule to differentiate each function.

(g) $y = \frac{4x^2}{2x+5}$

(h) $y = \frac{4x^2 - 2}{x^2 + 5}$

(i) $v(x) = \frac{x+1}{x^3 - 1}$

THE QUOTIENT RULE

3 Differentiate each function with respect to x.

(a) $y = \frac{\sqrt{x+1}}{x}$ **(b)** $f(x) = \frac{(x+1)^2}{x}$ **(c)** $y = \frac{x}{(x+1)^2}$

3 Differentiate each function with respect to x.

(d) $y=\frac{(2x+1)^3}{(3-x^2)^2}$ **(e)** $f(x)=\frac{x}{\sqrt{x+1}}$ **(f)** $y=\left(\frac{x+1}{x}\right)^2$

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4 $f(x)=\dfrac{\sqrt{x}}{x^2+1}$. Four steps in finding the simplest form of $f'(x)$ are given. Indicate whether each step is correct or incorrect.

A $f'(x)=\dfrac{(x^2+1)\times\dfrac{1}{2\sqrt{x}}-\sqrt{x}\times 2x}{(x^2+1)^2}$

B $f'(x)=\dfrac{\dfrac{x^2+1}{2\sqrt{x}}-2x\sqrt{x}}{(x^2+1)^2}$

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

D $f'(x)=\dfrac{5x^2+1}{2\sqrt{x}(x^2+1)^2}$

5 Find the derivative of each function.

(a) $y=(x^2-4)(x+2)$

(b) $f(x)=4x^{\frac{5}{2}}-2x^{\frac{3}{2}}+6x^{\frac{1}{2}}$

(c) $y=\sqrt{5x-1}$

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5 Find the derivative of each function.

(k) $y = (x^2 + 1)\sqrt{x}$

(l) $g(x) = \dfrac{\sqrt{x+1}}{\sqrt{x^2+1}}$

6 Show that the gradient of the tangent to the curve $y = \dfrac{x}{x^2+1}$ is zero twice, at $x = -1$ and $x = 1$.