D

1. a) $$f'(x) = \left(\ln\left(3x^2 + \frac{2}{x}\right)\right)' = \frac{6x - \frac{2}{x^2}}{3x^2 + \frac{2}{x}} = \frac{\frac{6x^3 - 2}{x^2}}{\frac{3x^3 + 2}{x}}$$

$$= \frac{6x^3 - 2}{3x^4 + 2x}$$

b) $$g'(x) = \left(\frac{e^{1-x}}{x^2 + x + 1}\right)' = \frac{-e^{1-x} \cdot (x^2 + x + 1) + e^{1-x} \cdot (2x + 1)}{(x^2 + x + 1)^2}$$

$$= e^{1-x} \cdot \frac{-x^2 - x - 1 + 2x + 1}{(x^2 + x + 1)^2} = e^{1-x} \cdot \frac{-x^2 + x}{(x^2 + x + 1)^2}$$

2. $f(x) = 2x^2 - 14x + 7$

$f'(x) = 4x - 14 = -10 \quad |+14$

$4x = 4$

$x = 1 \qquad f(1) = 2 \cdot 1 - 14 \cdot 1 + 7 = -5$

TEČNÝ BOD : $[1; -5]$

TEČNA $\quad y = -10x + b$

$-5 = -10 \cdot 1 + b \quad \Rightarrow \quad b = 5$

$$\boxed{y = -10x + 5}$$

3. $$\lim_{x \to 1} \frac{x^{12} - 1}{2 - 2x} \overset{L.P.}{=} \lim_{x \to 1} \frac{12x^{11}}{(-2)} = (-6) \cdot 1^{11} = \underline{\underline{-6}}$$

$\downarrow$

„$\frac{0}{0}$“