

These are extra, similar examples to the ones on your worksheet.

$$\begin{aligned}
 3a) \quad f(x) &= 3x^2 - 5x + 4 & \frac{f(x+h) - f(x)}{h} \\
 & & \frac{[3(x+h)^2 - 5(x+h) + 4] - [3x^2 - 5x + 4]}{h} = \\
 & & \frac{3x^2 + 6xh + 3h^2 - 5x - 5h + 4 - 3x^2 + 5x - 4}{h} = \frac{6xh + 3h^2 - 5h}{h} \\
 & & = 6x + 3h - 5
 \end{aligned}$$

$$\begin{aligned}
 3e) \quad f(x) &= x + 1 & g(x) &= 2x & f \circ g? & f \circ g = f(g(x)) \\
 & & f(2x) &= 2x + 1
 \end{aligned}$$

Helpful rules

good for questions 8 & 9

$$\bullet \ln(x) = \log_e(x) = y \text{ when } e^y = x$$

$$\bullet e^{\ln(x)} = x \quad \ln(e^x) = x$$

$$\bullet \ln(xy) = \ln(x) + \ln(y)$$

$$\bullet \ln\left(\frac{x}{y}\right) = \ln(x) - \ln(y)$$

$$\bullet \ln(x^y) = y \ln(x)$$

$$\bullet \ln(1) = 0 \quad e^0 = 1$$

$$\bullet \log_b(y) = x \quad y = b^x$$

Graphic transformations

$$\bullet x^2 + c \text{ - shifts up/down}$$

+c ↑ -c ↓

$$\bullet (x+c)^2 \text{ - shifts left/right}$$

+c left
-c right

$$\bullet c(x^2) \text{ - compresses or expands}$$

c > 1 - expand
c < 1 - compress

$$\bullet (cx^2) \quad 0 < c < 1$$

↳ stretches the graph

These are extra, similar examples to the ones on your work sheet.

7c) $\tan[\cos^{-1}(x)]$ (to an algebraic form)

let $\theta = \cos^{-1}(x)$
 $\cos(\theta) = x \rightarrow \cos(\theta) = \frac{x}{1}$

place on the triangle (CAH)

$\tan(\theta) = \frac{\sqrt{1-x^2}}{x}$ (TOA)

SOH CAH TOA

