NIS : 11800425

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4. $(f+g)(3)$ $f(x) = -2 - x^2$

   $\hookrightarrow f(3) + g(3)$ $g(x) = 5x + 2$

    $-2 - (3)^2 + 5(3) + 2$

    $-2 - 9 + 15 + 2 = 17 - 11$

               $= 6$ ✓

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5. $(f \cdot g)(-2)$ $f(x) = x^2 + 5$

                     $g(x) = 1 - 2x$

   $\hookrightarrow f(-2) \times g(-2)$

    $((-2)^2 + 5) \times 1 - 2(-2))$

    $(4 + 5) \times 5 = 45$ ✓

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6. $g \circ f (1)$ $f(x) = 3x^2 + 4$

                    $g(x) = 10 - 2x$

   $\hookrightarrow g(f(1))$

    $f(1) = 3 \cdot 1^2 + 4$

       $= 7$

   $g(7) = 10 - 2(7)$

       $= 10 - 14 = -4$ ✓

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7. $f(x) = 2x^2 + 5$ $(f \circ g)(x) = 2x^2 - 8x + 13$

  $f(g(x)) = 2x^2 - 8x + 13$

   $2(g(x))^2 + 5 = 2x^2 - 8x + 13$

    $g(x)^2 = \dfrac{2x^2 - 8x + 13 - 5}{2}$

   $g(x)^2 = x^2 - 4x + 4$

   $g(x) = \sqrt{x^2 - 4x + 4}$

$g(x) = x - 2$,

8. $f^{-1}(11)$ dari $f(x) = 2x^2 - 1$

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

$y + 1 = 2x^2$

$\dfrac{y+1}{2} = x^2$ $\qquad f^{-1}(11) = \dfrac{\sqrt{11+1}}{2}$

$\dfrac{\sqrt{y+1}}{2} = x$ $\qquad = \dfrac{\sqrt{12}}{2} = \sqrt{6}$,

9. $f^{-1}(-2)$ dari $f(x) = 2 - 4(x+1)$

$f(x) = 2 - 4(x+1)$

$y = 2 - 4x - 4$

$y + 4 - 2 = -4x$

$y + 2 = -4x$

$\dfrac{y+2}{-4} = x$

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

$f^{-1}(-2) = \dfrac{-2+2}{-4} = \dfrac{0}{-4} = 0$

10. $(g \circ f)^{-1}(3)$

$f(x) = \dfrac{3x-1}{4-x}$; $x \times 1$

$g(x) = x + 2$

$g \circ f(x) = \dfrac{3x-1}{4-x} + 2$

$y = \dfrac{3x-1}{4-x} + 2$

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$$y - 2(4 - x) = 3x - 1$$

$$4y - xy - 8 + 2x = 3x - 1$$

$$4y - 8 + 1 = 3x + xy - 2x$$

$$4y - 7 = x + xy$$

$$4y - 7 = x(y + 1)$$

$$\frac{4y - 7}{y + 1} = x$$

$\hookrightarrow (g \circ f)^{-1} (3)$

$$\frac{4(3 - 7)}{(3) + 1} = \frac{5}{4} \quad \checkmark$$

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