BECA / Hanson

IB 9 January 2020

4.6 Homework

Solutions

1. $f(2x-1) = 3(2x-1)+2$
$= 6x-1$

2. $f(2x-1) = (2x-1)^2 - 1$
$= 4x^2 - 2x$

3. $f(x+1) = (x+1)^3$
$= x^3 + 3x^2 + 3x + 1$

4. $f(\frac{1}{2}x-3) = 4 - \left(2(\frac{1}{2}x-3)^2 + (\frac{1}{2}x-3)\right)$
$= 4 - (\frac{1}{2}x^2 - 6x + 18 + \frac{1}{2}x - 3)$

$= -\frac{1}{2}x^2 + 5\frac{1}{2}x - 11$

5. $(f \circ g)(x) = (x^2)^2 + 2$
$= x^4 + 2$

6. $f \circ g = \frac{1}{2}(2x)^2 + 1$
$= 2x^2 + 1$

7. $f \circ g = \sqrt{(x^2+4) - 4}$
$= |x|$ ←

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

$= \dfrac{-2x-2}{(2x+3)^2}$

9. a) $\frac{1}{2}x^2 + x$
b) $\frac{1}{2}x^3 + x^2 - 2x - 4$
c) $\dfrac{1/2\,x^2 - 2}{x+2}$

10. $y = 3x+2$

f^{-1}: $x = 3y+2$

$y = \frac{x-2}{3}$

11. $y = \frac{1}{2}x+2$

f^{-1}: $x = \frac{1}{2}y+2$

$y = 2x-4$

12. $y = \frac{2}{3}x^2-3$

$x = \frac{2}{3}y^2-3$

$y^2 = \frac{3}{2}(x+3)$

$y = \sqrt{\frac{3}{2}(x+3)}$

13. $y = \sqrt{(x-1)} + \frac{1}{2}$

f^{-1}: $x = \sqrt{y-1} + \frac{1}{2}$

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