



9) origin  
 $(-x)^3 - 3(-y) = 5(-x) + 7(-y)^5$   
 $-1 \left( -x^3 + 3y = -5x - 7y^5 \right)$   
 $x^3 - 3y = 5x + 7y^5$  yes

b) x-axis  
 $x = 5(-y)^4 - 8(-y)^2 + 4$   
 $x = 5y^4 - 8y^2 + 4$  yes

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$f = x^2 + 2x - 4$  extra example of difference quotient

$$\frac{f(x+h) - f(x)}{h}$$

$$\frac{[(x+h)^2 + 2(x+h) - 4] - [x^2 + 2x - 4]}{h}$$

$$\frac{x^2 + 2xh + h^2 + 2x + 2h - 4 - x^2 - 2x + 4}{h}$$

$$\frac{2xh + h^2 + 2h}{h} = 2x + h + 2$$

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6)  $f = |x|$   
 $3|x+4| - 7$

$g = \sqrt[3]{\frac{x+5}{2}}$   
 $f \circ g = 2\left(\sqrt[3]{\frac{x+5}{2}}\right)^3 - 5$   
 $= 2\left(\frac{x+5}{2}\right) - 5$

$g \circ f = \sqrt[3]{\frac{(2x^3-5)+5}{2}}$   
 $= \sqrt[3]{\frac{2x^3}{2}}$   
 $= \sqrt[3]{x^3}$   
 $= x$

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10)

x	0	1	2	3	4
f	5	2	1	4	0

$f \circ f(4) = f(f(4)) = f(0) = 5$

x	0	1	2	4	5
g	3	4	2	0	1

a)  $f \circ g(5) = f(g(5)) = f(1) = 2$

$f \circ g(0) = f(g(0)) = f(3) = 4$

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1)

$$a) f(x) = 2\left(\frac{1}{2}\right) - \left|\frac{1}{2}\right| + \left[\frac{1}{2}\right]$$

$$= 1 - \frac{1}{2} + 0 = \frac{1}{2}$$

$$b) f(-3.5) = 2(-3.5) - |-3.5| + \lceil -3.5 \rceil$$

$$= -7 - 3.5 - 4 = -14.5$$

$$c) 2\left(-\frac{3}{2}\right) - \left|-\frac{3}{2}\right| + \lceil -\frac{3}{2} \rceil$$

$$= -3 - \frac{3}{2} - 2 = -6.5$$

2)

$$f(x) - 3g\left(\frac{5}{2}\right)$$

$$\left[0^2 + 2\left(\frac{5}{2}\right) - 4\right] - 3\left[7 - 2\left(\frac{5}{2}\right)\right]$$

$$4 - 3[2] = -2$$

3)

$$f+g = x^2 + 2x - 4 + 7 - 2x$$

$$= x^2 + 3$$

$$= (-4)^2 + 3 = 19$$

$$f = x^2 + 2x - 4$$

4)  $f \circ g = (7-2x)^2 + 2(7-2x) - 4$

$$(7-2x)(7-2x)$$

$$= 49 - 14x - 14x + 4x^2 + 14 - 4x - 4$$

$$= 4x^2 - 32x + 59$$

5)

$$\frac{f(7-2(x+h)) - f(7-2x)}{h}$$

$$= \frac{7-2(x+h) - 7 + 2x}{h}$$

$$= \frac{-2h}{h} = -2$$

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7)

$$f = 2x^3 - 5$$

$$g = \sqrt[3]{\frac{x+5}{2}}$$

$$g \circ f = \sqrt[3]{\frac{(2x^3-5)+5}{2}}$$

$$= \sqrt[3]{\frac{2x^3}{2}}$$

$$= \sqrt[3]{x^3} = x$$

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