

October 28, 2015

$$g(m) = 2m + 5$$

$$h(m) = -m^2 + 5$$

#1) $(g \circ h)(m) = g(h(m))$

$$= 2m + 5 - (-m^2 + 5)$$

$$= 2m + 5 + m^2 - 5$$

$$= m^2 + 2m$$

#2) $(h \circ h)(m) = h(h(m))$

$$= -(-m^2 + 5)^2 + 5$$

$$= -(m^4 - 10m^2 + 25) + 5$$

$$= -m^4 + 10m^2 - 25 + 5$$

$$= -m^4 + 10m^2 - 20$$

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#3) $(g \circ h)(-5 + m)$

$$= g(h(-5 + m))$$

$$= 2(-(-5 + m)^2 + 5) + 5$$

$$= 2(-(25 - 10m + m^2) + 5) + 5$$

$$= 2(-25 + 10m - m^2 + 5) + 5$$

$$= -50 + 20m - 2m^2 + 10 + 5$$

$$= -2m^2 + 20m - 35$$

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#4) $f(x) = 3x^2 - 7x + 2$

$$3\left(x^2 - \frac{7}{3}x + \frac{2}{3}\right)$$

$$3\left(x^2 - \frac{7}{3}x = -\frac{2}{3}\right)$$

$\textcircled{a} -\frac{7}{3} \cdot \frac{1}{2} = -\frac{7}{6}$
 $\textcircled{b} \left(-\frac{7}{6}\right)^2 = \frac{49}{36}$

$$3\left(x - \frac{7}{6}\right)^2 = -\frac{2}{3} + \frac{49}{36}$$

$$= \frac{-24 + 49}{36} = \frac{25}{36}$$

$$3\left[\left(x - \frac{7}{6}\right)^2 - \frac{25}{36}\right]$$

$$f(x) = 3\left(x - \frac{7}{6}\right)^2 - \frac{25}{12}$$

Vertex: $\left(\frac{7}{6}, -\frac{25}{12}\right)$

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