

Bellwork Alg 2 Wednesday, September 12, 2018

Use the following functions for 1 and 2. Find each composite. Simplify your answer.

$$f(x) = x - 5 \quad g(x) = 2x - 3 \quad h(x) = 2x^2 - 3x + 7 \quad k(x) = \frac{3x - 5}{2x + 12}$$

1. Find $(h \circ f)(x)$

2. Find $k(g(x))$.

3. Factor completely. $1250x^6 - 2592x^2$

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1. Find $(h \circ f)(x)$

$$\begin{aligned} h(f(x)) &= 2(x-5)^2 - 3(x-5) + 7 \\ &= 2(x^2 - 10x + 25) - 3(x-5) + 7 \\ &= 2x^2 - 20x + 50 - 3x + 15 + 7 \end{aligned}$$

$$h(f(x)) = 2x^2 - 23x + 72$$

2. Find $k(g(x))$.

$$\begin{aligned} k(g(x)) &= \frac{3(2x-3) - 5}{2(2x-3) + 12} \\ &= \frac{6x - 9 - 5}{4x - 6 + 12} \\ &= \frac{6x - 14}{4x + 6} \end{aligned}$$

$$k(g(x)) = \frac{3x - 7}{2x + 3}$$

3. Factor completely. $1250x^6 - 2592x^2$

$$\begin{aligned} &= 2x^2(625x^4 - 1296) \\ &= 2x^2(25x^2 + 36)(25x^2 - 36) \\ &= 2x^2(25x^2 + 36)(5x + 6)(5x - 6) \end{aligned}$$

$$\sqrt{625} = 25$$

$$\sqrt{1296} = 36$$