

$$f(x) = x^2 + 4x$$

$$c(x) = 6 + \sqrt[3]{5-x}$$

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

$$k(x) = 1 - 3x$$

$$m(x) = (x+3)^2$$

$$h(x) = 5\sqrt{x+1}$$

Find:

$$1. c(f(-8))$$

$$2. m(k(2))$$

$$3. f(x) - 2k(x)$$

$$4. x \text{ if } m(x) = 49$$

$$5. 7c(4) + 2h(35)$$

$$6. m(f(-1))$$

$$7. f(x) \cdot k(x)$$

$$8. w(f(x))$$

$$9. f(h(x))$$

$$10. x \text{ if } c(x) = 2$$

$$\textcircled{1} \quad c(f(-8))$$

$$\begin{aligned} F(-8) &= (-8)^2 + 4(-8) \\ &= 64 - 32 \\ &= 32 \\ C(32) &= 6 + \sqrt[3]{5-32} \\ &= 6 + \sqrt[3]{-27} \\ &= 6 + (-3) \\ &= 3 \end{aligned}$$

$$\textcircled{2} \quad m(k(2))$$

$$\begin{aligned} K(2) &= 1 - 3(2) \\ &= -5 \\ m(-5) &= (-5+3)^2 \\ &= (-2)^2 \\ &= 4 \end{aligned}$$

$$\textcircled{3} \quad f(x) - 2k(x)$$

$$\begin{aligned} &= x^2 + 4x - 2(1 - 3x) \\ &= x^2 + 4x - 2 + 6x \\ &= x^2 + 10x - 2 \end{aligned}$$

$$\textcircled{4} \quad m(x) = 49$$

$$\begin{aligned} \sqrt{(x+3)^2} &= \sqrt{49} \\ x+3 &= \pm 7 \\ -3 & \quad -3 \\ x = -3+7 & \quad \text{or} \quad x = -3-7 \\ x = 4 & \quad \text{or} \quad x = -10 \end{aligned}$$

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$$\textcircled{5} \quad 7c(4) + 2h(35)$$

$$\begin{aligned} &= 7(6 + \sqrt[3]{5-4}) + 2(5\sqrt{35+1}) \\ &= 7(6+1) + 2(5\sqrt{36}) \\ &= 7(7) + 2(5(6)) \\ &= 49 + 60 \\ &= 109 \end{aligned}$$

$$\textcircled{6} \quad m(f(-1))$$

$$\begin{aligned} f(-1) &= (-1)^2 + 4(-1) \\ &= 1 - 4 \\ &= -3 \\ m(-3) &= (-3+3)^2 \\ &= 0 \end{aligned}$$

$$\textcircled{7} \quad f(x) \cdot k(x)$$

$$\begin{aligned} &= (x^2 + 4x)(1 - 3x) \\ &\text{FOIL} \\ &= \underline{\underline{x^2}} - 3x^3 + 4x - \underline{\underline{12x^2}} \\ &= -3x^2 - 11x^2 + 4x \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad w(f(x)) \\ &= w(x^2 + 4x) \\ w(x) &= \frac{x+2}{x+7} \\ &= \frac{(x^2 + 4x) + 2}{(x^2 + 4x) + 7} \\ &= \frac{x^2 + 4x + 2}{x^2 + 4x + 7} \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad f(h(x)) \\ &= f(5\sqrt{x+1}) \\ &= (5\sqrt{x+1})^2 + 4(5\sqrt{x+1}) \\ &= 25(x+1) + 20\sqrt{x+1} \\ &= 25x + 25 + 20\sqrt{x+1} \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 6 + \sqrt[3]{5-x} &= 2 \\ -6 &\quad -6 \\ (\sqrt[3]{5-x})^3 &= (-4)^3 \\ 5-x &= -64 \\ -5 &\quad -5 \\ -x &= -69 \\ x &= 69 \end{aligned}$$