

1.2 revised 9/15/2023



$$10) p(x) = \sqrt{x+1} \quad q(x) = 2x - 4$$

$$\begin{aligned} a) A(x) &= p(x) + q(x) \\ &= (\sqrt{x+1}) + (2x-4) = \underline{\underline{\sqrt{x+1} + 2x - 4}} \end{aligned}$$

$$\begin{aligned} b) B(x) &= p(x) - q(x) \\ &= (\sqrt{x+1}) - (2x-4) = \underline{\underline{\sqrt{x+1} - 2x + 4}} \end{aligned}$$

$$c) C(x) = p(x)q(x) = \underline{\underline{(\sqrt{x+1})(2x-4) = 2x\sqrt{x+1} - 4\sqrt{x+1}}}$$

$$d) D(x) = \frac{p(x)}{q(x)} = \frac{(\sqrt{x+1})}{(2x-4)} = \underline{\underline{\frac{\sqrt{x+1}}{2x-4}}}$$

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$$12) h(n) = 2 - 5n, \quad p(n) = n^2 - 3$$

$$\begin{aligned} u(n) &= h(p(n)) = h(n^2 - 3) = 2 - 5(n^2 - 3) = 2 - 5n^2 + 15 \\ &= 17 - 5n^2 \end{aligned}$$

$$u(2) = 17 - 5(2)^2 = 17 - 5(4) = 17 - 20 = \underline{\underline{-3}}$$

$$\begin{aligned} v(n) &= p(h(n)) = (2 - 5n)^2 - 3 = (4 - 20n + 25n^2) - 3 \\ &= 25n^2 - 20n + 1 \end{aligned}$$

$$\begin{aligned} v(2) &= 25(2)^2 - 20(2) + 1 = 25(4) - 40 + 1 \\ &= 100 - 40 + 1 = \underline{\underline{61}} \end{aligned}$$

$$14) f(x) = x^3 + 2, \quad g(x) = 2x + 3$$

$$\begin{aligned} f(g(x)) &= f(2x+3) = (2x+3)^3 + 2 \\ &= (2x+3)(4x^2+12x+9) + 2 = (8x^3+24x^2+18x+12x^2+36x+27)+2 \\ &= 8x^3+36x^2+54x+29 \end{aligned}$$

$$f(-1) = 8(-1)^3 + 36(-1)^2 + 54(-1) + 29 = -8 + 36 - 54 + 29 = \underline{\underline{3}}$$

revised

$$\rightarrow h(x) = g(f(x)) = g(x^3+2) = 2(x^3+2)+3 = 2x^3+4+3 = \underline{\underline{2x^3+7}}$$

$$h(-2) = 2(-2)^3 + 7 = 2(-8) + 7 = -16 + 7 = \underline{\underline{-9}}$$

$$16) f(x) = 1-x^3 \quad g(x) = \frac{1}{x}$$

$$f(g(x)) = f\left(\frac{1}{x}\right) = 1 - \left(\frac{1}{x}\right)^3 = 1 - \frac{(1)^3}{x^3} = \underline{\underline{1 - \frac{1}{x^3}}}$$

$$g(f(x)) = g(1-x^3) = \frac{1}{(1-x^3)} = \underline{\underline{\frac{1}{1-x^3}}}$$

$$18) f(x) = 1-3x \quad g(x) = 5x^2+3x+2$$

$$\begin{aligned} f(g(x)) &= f(5x^2+3x+2) = 1-3(5x^2+3x+2) \\ &= 1-15x^2-9x-6 = \underline{\underline{-15x^2-9x-5}} \end{aligned}$$

$$\begin{aligned} g(f(x)) &= g(1-3x) = 5(1-3x)^2 + 3(1-3x) + 2 \\ &= 5(1-6x+9x^2) + 3-9x+2 = 5-30x+45x^2+3-9x+2 \\ &= \underline{\underline{45x^2-39x+10}} \end{aligned}$$

$$20) f(x) = \sqrt{2x+3} \quad g(x) = x^2 + 1$$

$$f(g(x)) = f(x^2 + 1) = \sqrt{2(x^2 + 1) + 3} = \sqrt{2x^2 + 2 + 3} = \sqrt{2x^2 + 5}$$

$$g(f(x)) = g(\sqrt{2x+3}) = (\sqrt{2x+3})^2 + 1 = (2x+3) + 1 = \underline{2x+4}$$


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$$26) x: \text{wind speed (mi/hr)} \quad p(x) = \sqrt{1400x} \text{ "kilowatts"}$$

$$x: \text{kilowatts} \quad f(x) = 0.34x$$

$$a) r(x) = f(p(x)) = f(\sqrt{1400x}) = 0.34(\sqrt{1400x}) = 0.34(\sqrt{(14)(100)x}) \\ = 0.34(\sqrt{100} \sqrt{14x}) = 0.34(10\sqrt{14x}) = 3.4\sqrt{14x}$$

$r$  measure people supported by speed of wind in mi/hr.

$$b) r(18) = 3.4\sqrt{14(18)} = 3.4\sqrt{2(7)(2(9))} = 3.4\sqrt{(2)^2(9)7} \\ = 3.4\sqrt{(2)^2} \sqrt{9} \sqrt{7} = 3.4(2)(3)\sqrt{7} = 20.4\sqrt{7}$$

wind that is 18 mi/hr can support  $20.4\sqrt{7}$  amount of people

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$$30) h(x) = \sqrt{x^3 - 1} \quad h(x) = f(g(x))$$

$$\text{let } f(x) = \sqrt{x} \quad g(x) = x^3 - 1$$


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$$32) h(x) = \frac{1}{x^2 - 5} \quad h(x) = f(g(x))$$

$$\text{let } f(x) = \frac{1}{x} \quad g(x) = x^2 - 5$$


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