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$$f(x) = x^4 + 1, g(x) = x - 5, h(x) = \sqrt{x}$$

$$\textcircled{1} (f \circ g \circ h)(x) = f(g(h(x)))$$

$$= ((\sqrt{x}) - 5)^4 + 1$$

$$= [(\sqrt{x} - 5)(\sqrt{x} - 5)](\sqrt{x} - 5)(\sqrt{x} - 5) + 1$$

$$= [x - 10\sqrt{x} + 25](\sqrt{x} - 5)$$

$$= x\sqrt{x} - 10x + 25\sqrt{x} - 5x + 50\sqrt{x} - 125$$

$$= x\sqrt{x} - 15x + 75\sqrt{x} - 125$$

$$= x^2 - 15x\sqrt{x} + 75x - 125\sqrt{x}$$

$$= x^2 - 20x\sqrt{x} - 500\sqrt{x} + 150x + 625$$

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$$(h \circ g \circ h)(x) = h(g(h(x)))$$

$$= \sqrt{((\sqrt{x}) - 5)}$$

$$= \sqrt{\sqrt{x} - 5}$$

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Difference quotient

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

$$f(x) = 2x$$

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

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

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$$f(x) = 3x - 5$$

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

$$\frac{3(x+h) - 5 - (3x - 5)}{h}$$

$$\frac{3x + 3h - 5 - 3x + 5}{h}$$

$$\frac{3h}{h} = 3$$

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$$f(x) = x^2 + 2x + 5$$

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

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

$$\cancel{h} \frac{2x + h + 2}{\cancel{h}} = 2x + h + 2$$

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