6. Let g be a function from $\mathbb{Z}^+$ (the set of positive integers) to $\mathbb{Q}$ (the set of rational numbers) defined by

$$(x, y) \in g \text{ iff } y = 4x - 3/7 (g \subseteq \mathbb{Z}^+ \times \mathbb{Q})$$

and let f be a function on $\mathbb{Z}^+$ defined by

$$(x, y) \in f \text{ iff } y = 5x^2 + 2x - 3 (f \subseteq \mathbb{Z}^+ \times \mathbb{Z}^+)$$

What is the image of x under $g \circ f$ (ie $g \circ f(x)$)?

$$\begin{aligned} g \circ f &= g\Big(f(x)\Big) \\ &= 4\Big(f(x)\Big) - \frac{3}{7} \\ &= 4\left(5x^2 + 2x - 3\right) - \frac{3}{7} \\ &= 20x^2 + 8x - 12 - \frac{3}{7} \\ &= 20x^2 + 8x - 12\frac{3}{7} \end{aligned}$$