

NAME: _____

P.I. A2.A.42: Find the composition of functions

1. Tell whether this statement is *always*, *sometimes*, or *never* true: $f(g(x)) = g(f(x))$. Explain your answer.
2. If $f(x) = x - 3$ and $g(x) = x^2 + 4x - 1$, write the function rule for $f(g(x))$ and for $g(f(x))$. Graph both using a graphing calculator. Describe two ways that the graphs are alike and two ways they are different.

- [1] Sometimes; students should give one example for which it is true and one for which it is not true.

Answer will vary. Sample: Both graphs are parabolas and have a y-intercept of -4 . $f(g(x))$ has a minimum at $(-2, -8)$ and $g(f(x))$ has a minimum at $(1, -5)$; $f(g(x))$ has an axis of symmetry at

- [2] $x = -2$; $g(f(x))$ has an axis of symmetry at $x = 1$.
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