
**Solution.** The roots of $x^2 - 3x - 18$ are 6 and $-3$, so that $x^2 - 3x - 18 = (x-6)(x+3)$. These roots can found either by trying the factors of $-18$, by the quadratic formula, or by completing the square. The factors of $-18$ are $\pm 1$, $\pm 2$, $\pm 3$, $\pm 6$, and $\pm 9$; one easily sees that $\pm 1$ and $\pm 2$ are not roots while $-3$ is a root because
\[ (-3)^2 - 3(-3) - 18 = 9 + 9 - 18 = 0. \]
The other root is found by using either the fact that the sum of the roots is 3 or the fact that the product of the roots is $-18$. The quadratic formula yields the roots
\[ \frac{3 \pm \sqrt{3^2 - 4(-18)}}{2} = \frac{3 \pm \sqrt{9 + 72}}{2} = \frac{3 \pm \sqrt{81}}{2} = \frac{3 \pm 9}{2}. \]
Completing the square produces the factors
\[ x^2 - 3x - 18 = (x - \frac{3}{2})^2 - 18 - \left(\frac{3}{2}\right)^2 = (x - \frac{3}{2})^2 - \frac{72}{4} - \frac{9}{4} = (x - 6)(x + 3). \]

(2) [6] Let $f(x) = x^2 - 2x + 5$ and $g(x) = x - 3$.

(a) Evaluate $f(x) + g(x)$.

**Solution.**
\[ f(x) + g(x) = (x^2 - 2x + 5) + (x - 3) = x^2 - x + 2. \]

(b) Evaluate $f(g(x))$.

**Solution.**
\[ f(g(x)) = g(x)^2 - 2g(x) + 5 = (x - 3)^2 - 2(x - 3) + 5 = x^2 - 6x + 9 - 2x + 6 + 5 = x^2 - 8x + 20. \]

(3) [1] Is the point $(2, -1)$ on the graph of the function $h(x) = 3x$?

**Solution.** No, because $h(2) = 3 \cdot 2 = 6 \neq -1$. 

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