

**Exercise 37**

For the following exercises, for each pair of functions, find a.  $f + g$  b.  $f - g$  c.  $f \cdot g$  d.  $f/g$ . Determine the domain of each of these new functions.

$$f(x) = x - 8, g(x) = 5x^2$$

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**Solution**

$$f + g = f(x) + g(x) = (x - 8) + (5x^2) = 5x^2 + x - 8 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f - g = f(x) - g(x) = (x - 8) - (5x^2) = -5x^2 + x - 8 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f \cdot g = f(x)g(x) = (x - 8)(5x^2) = 5x^3 - 40x^2 \quad \text{Domain: } \{x \mid -\infty < x < \infty\}$$

$$f/g = \frac{f(x)}{g(x)} = \frac{x - 8}{5x^2} \quad \text{Domain: } \{x \mid x \neq 0\}$$