Compound Inequalities

1. Solve each compound inequality.

   a) $x - 1 < 5$ or $2x > 30$

   b) $3x < -5$ or $2x \geq 3$

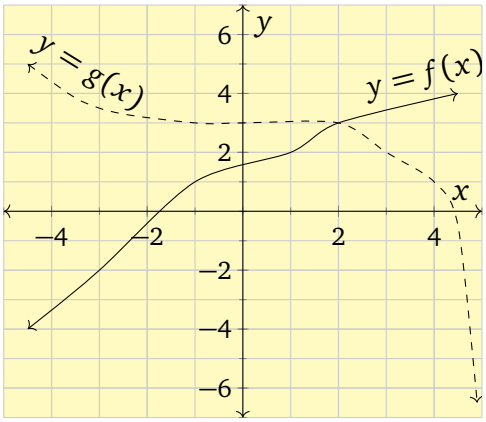
   c) $-27 \leq 3x \leq 9$

   d) $2 - x > -5$ or $2 + x \leq 4$

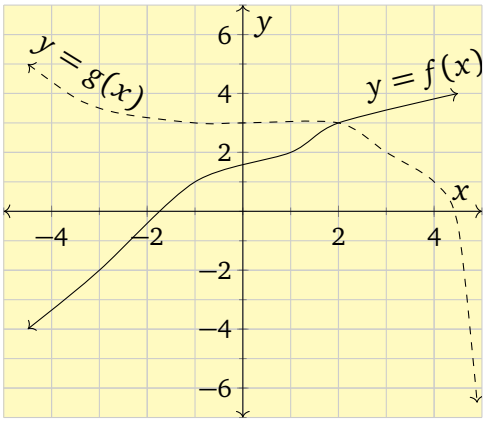
   e) $0.5 < x^3 \leq 2$

   f) $-2 \leq 5 - \frac{1}{3}x < 2$

2. Here are the graphs of f (solid) and g (dashed). Solve: $f(x) < 2$ or $g(x) \leq 1$.



3. Here are the graphs of f (solid) and g (dashed). Solve: $1 < f(x) < g(x)$.



4. If the dew point D on the ground is 60°F, then the dew point for a community x miles above sea level is given by $D(x) = 60 - 5.8x$. Find the altitudes where the dew point is between 57.1°F and 51.3°F. (Your first algebra step should be to write a compound inequality that this scenario describes.)

5. The formula $F = \frac{9}{5}C + 32$ may be used to convert Celsius temperatures to Fahrenheit temperatures. The greatest temperature ranges on Earth for one place are recorded in Siberia where the temperature has varied from −90°F to 98°F. Set up (and then solve) a compound inequality that describes Fahrenheit temperatures that can happen in Siberia, but whose solutions describe Celsius temperatures that can happen in Siberia.

6. You can kill bedbug eggs either by placing them in temperatures lower than 3°F or higher than 118°F. For which Celsisu temperatures would bed bug eggs be exterminated? Set up (and then solve) a compound inequality.