1. Represent \( \{ x : 2 \leq x < 5 \} \) using interval notation and as a graph on a line. \([2, 5)\)

2. Represent \( \{ x : x \leq 4 \} \) using interval notation and as a graph on a line. \((-\infty, 4]\)

3. What is the distance along a road between milepost 345 and milepost 102? \(345 - 102 = 243 \) miles

4. If \( b \) is bigger than \( a \), what is the difference between \( b \) and \( a \)? \( b - a \)

5. If \( c \) and \( d \) are any pair of numbers, what is the distance between \( c \) and \( d \)? \( |c - d| \)

6. If \( x \in [3, 10] \), express its distance from the center of the interval. \(|x - c|\) where \( c = (3+10)/2 = 6.5 \)

7. Represent \(|x| \leq 3\) using a pair of inequalities and using interval notation. \(-3 \leq x \leq 3\) or \([-3, 3]\)

8. Represent \(|x| < 4\) using a pair of inequalities and using interval notation. \(-4 < x < 4\) or \((-4, 4)\)

9. Represent \(|x - 2| < 1\) using a pair of inequalities and using interval notation. \(-1 < x - 2 < 1\) or \((1, 3)\)

10. Represent \(|x + 3| < 0.2\) using ... inequalities and ... interval notation. \(-0.2 < x + 3 < 0.2\) or \((-3.2, -2.8)\)

11. Consider \( f(x) = 3x - 5 \) on the interval \([1, 3]\)
   a) Find the target value \( f(2) \) \( f(2) = 3*2 - 5 = 1 \)
   b) Find a domain subinterval that yields other values within 1.2 units of the target.
   \( \text{Solve } |f(x) - 1| < 1.2 \)
   \(-1.2 < 3x - 5 - 1 < 1.2 \)
   \(4.8 < 3x < 7.2 \)
   \(1.6 < x < 2.4 \)

12. Consider \( g(x) = 5x + 1 \) on the interval \([0, 2]\)
   a) Find the target value \( g(1) \) \( g(1) = 5*1 + 1 = 6 \)
   b) Find a domain subinterval that yields other values within 1 unit of the target.
   \( \text{Solve } |g(x) - 6| < 1 \)
   \(-1 < 5x + 1 - 6 < 1 \)
   \(4 < 5x < 6 \)
   \(0.8 < x < 1.2 \)

13. Consider \( h(x) = x/2 \) on the interval \([0, 8]\)
   a) Find the target value \( h(4) \) \( h(4) = 4/2 = 2 \)
   b) Find a domain subinterval that yields other values within 0.8 unit of the target.
   \( \text{Solve } |h(x) - 2| < 0.8 \)
   \(-0.8 < x/2 - 2 < 0.8 \)
   \(1.2 < x/2 < 2.8 \)
   \(2.4 < x < 5.6 \)

14. Consider \( F(x) = \frac{2x^2 - 5x + 2}{x - 2} \), for \( x \neq 2 \)
   a) Sketch the graph of \( F(x) \) on the interval \([0, 4]\)
   \( \text{Graph at right.} \)
   b) From the graph, or table of values, estimate a target for \( x = 2 \).
   \( F(x) \) is near 3
   c) Find a domain subinterval that yields values within 0.6 of that target.
   \( \text{Solve } |F(x) - 3| < 0.6 \)
   \(-0.6 < (x - 2)(2x - 1)/(x - 2) - 3 < 0.6 \)
   \(-0.6 < (2x - 1) - 3 < 0.6 \)
   \(3.4 < 2x < 4.6 \)
   \(1.7 < x < 2.3 \)

15. Find bound on \(|3x - 2|\) for \( x \) in the interval \([0, 2]\)
   If \( 0 < x < 2 \), then \( 0 < 3x < 6 \) and \(-2 < 3x - 2 < 4 \).
   \( \text{Hence } 0 \leq |3x - 2| < 4 \) from graph of \( y = |3x - 2| \)
   So upper bound is 4.

16. Consider \( G(x) = 3x^2 - 5x \) on the interval \([0, 2]\)
   a) Find the target value \( G(1) \) \( G(1) = 3 - 5 = -2 \)
   b) Find a domain subinterval that yields values within 1.2 of that target.
   \( \text{Solve } |G(x) - (-2)| < 1.2 \)
   \( |3x^2 - 5x + 2| < 1.2 \)
   \(|x - 1)(3x - 2)| < 1.2 \)
   \(|x - 1)*4| < 1.2 \) if \( 0 < x < 2 \)
   \(|x - 1| < 0.3 \) for \( 0 < x < 2 \)
   \( \text{Domain subinterval is } (0.7, 1.3) \) in \((0, 2)\)