1. (3pts) Solve for $x$

\[ 4x + 7 < 9x + 22 \]
\[-5x < 15 \] (subtract 9$x$ and 7 from both sides)
\[ x > -3 \] (divide both sides by $-5$, flip the inequality sign)

2. (5pts) Dan wants to buy some CDs over the internet. He saved $70. If the cost of each CD is $12, and the shipping is $10, how many CDs can he buy?

Let $x$ denote the number of CDs. Then the total cost is $10 + 12x$ which must be less than or equal to 70. Hence

\[ 10 + 12x \leq 70 \]
\[ 12x \leq 60 \] (subtract 10 from both sides)
\[ x \leq 5 \] (divide both sides by 12)
Dan can buy at most 5 CDs.

3. (8pts) Solve for $x$

\[ |2x - 5| = |3x + 15| \]

If two numbers have same absolute value, they are either same or opposite. Thus either $2x - 5 = 3x + 15$ or $2x - 5 = -(3x + 15)$. Solve both equations to obtain the solutions to the original equation.

First case
\[ 2x - 5 = 3x + 15 \]
\[-x = 20 \] (subtract 3$x$ and $-5$ from both sides)
\[ x = -20 \] (multiply both sides by $-1$)
Second case

\[2x - 5 = -(3x + 15)\]
\[2x - 5 = -3x - 15\] (clear parentheses)
\[5x = -10\] (add 3x and 5 to both sides)
\[x = -2\] (divide both sides by 5)

4. (9pts) Find the distance between following pairs of points and determine whether they are on the same vertical or horizontal line or neither.

(a) (3pts) \(A = (9, 4), B = (9, -2)\)

Since \(A\) and \(B\) have the same \(x\)-coordinate, they are on the same vertical line. To find the distance, it suffices to find the vertical distance, i.e. the difference between their \(y\)-coordinates. Thus
\[d(A, B) = |4 - (-2)| = 6\]

(b) (3pts) \(A = (8, 2), B = (0, 8)\)

\(A\) and \(B\) have different \(x\)- and \(y\)-coordinates, thus they are neither on the same horizontal, nor on the same vertical line. To find the distance, use the distance formula:
\[d = \sqrt{(8 - 2)^2 + (0 - 8)^2}\]
\[d = \sqrt{36 + 64}\]
\[d = \sqrt{100}\]
\[d = 10\]

(c) (3pts) \(A = (-1, -4), B = (5, -4)\)

Since \(A\) and \(B\) have the same \(y\)-coordinate, they are on the same horizontal line. To find the distance, it suffices to find the horizontal distance, i.e. the difference between their \(x\)-coordinates. Thus
\[d(A, B) = |-1 - 5| = 6\]