The following are not in Enable, but will appear on midterm 2 and the final exam.

Translate the following into absolute value equations or inequalities.
It helps to turn each of these into a sentence of the form
"the distance between ___ and ___ is _____".

The **blue** numbers represent distances,
and the **orange** numbers represent points on a number line.

eg. the distance between x and **9** is **2** ANSWER: $|x - 9| = 2$

eg. x is closer than 6 away from 3 ANSWER: $|x - 3| < 6$
ie. the distance between x and **3** is less than **6**

eg. x and 2 are at least 5 apart ANSWER: $|x - 2| \geq 5$
ie. the distance between x and **2** is greater than or equal to **5**

[1] –8 is 4 away from x

[2] 7 and x are farther than 3 apart

[3] x and 3 are separated by no more than 7

[4] x is within 7 of 3

[5] x is at most 7 away from 3

[6] x is a maximum of 3 away from 7

[7] x and 7 are no closer than 3 away from each other

[8] x and 3 are separated by at least 7

[9] x is beyond 3 of 7

[10] x is no farther than 7 away from 3

[11] x is no less than 7 away from 3

[12] x is a minimum of 3 away from 7

[13] 7 and x are closer than 3 apart

SOLUTIONS

[1] –8 is 4 away from x

the distance between x and –8 is 4 $\quad |x - -8| = 4$ or $|x + 8| = 4$

[2] 7 and x are farther than 3 apart

the distance between x and 7 is greater than 3 $\quad |x - 7| > 3$

[3] x and 3 are separated by no more than 7

the distance between x and 3 is less than or equal to 7 $\quad |x - 3| \leq 7$

[4] x is within 7 of 3

the distance between x and 3 is less than or equal to 7 $\quad |x - 3| \leq 7$

[5] x is at most 7 away from 3

the distance between x and 3 is less than or equal to 7 $\quad |x - 3| \leq 7$

[6] x is a maximum of 3 away from 7

the distance between x and 7 is less than or equal to 3 $\quad |x - 7| \leq 3$

[7] x and 7 are no closer than 3 away from each other

the distance between x and 7 is greater than or equal to 3 $\quad |x - 7| \geq 3$

[8] x and 3 are separated by at least 7

the distance between x and 3 is greater than or equal to 7 $\quad |x - 3| \geq 7$

[9] x is beyond 3 of 7

the distance between x and 7 is greater than 3 $\quad |x - 7| > 3$

[10] x is no farther than 7 away from 3

the distance between x and 3 is less than or equal to 7 $\quad |x - 3| \leq 7$

[11] x is no less than 7 away from 3

the distance between x and 3 is greater than or equal to 7 $\quad |x - 3| \geq 7$

[12] x is a minimum of 3 away from 7

the distance between x and 7 is greater than or equal to 3 $\quad |x - 7| \geq 3$

[13] 7 and x are closer than 3 apart

the distance between x and 7 is less than 3 $\quad |x - 7| < 3$