

Key

Day 1 Placemat (Foundations skills needed for Unit 1)

1. Solve: $\frac{3}{x} = \frac{12}{15}$ $12x = 45$
 $\frac{12}{12} = \frac{12}{12}$
 $x = 3.75$

2. Solve: $\frac{3}{x} = \frac{x}{27}$ $x^2 = 81$
 $\sqrt{x^2} = \sqrt{81}$
 $x = 9, -9$

3. Solve: $\frac{3}{x+2} = \frac{15}{20}$ $15(x+2) = 60$
 $15x + 30 = 60$
 $15x = 30$
 $x = 2$

4. Segment Addition Postulate:
 In the segment below,
 $AB = 2x + 9$, $BC = 4x - 7$, $AC = 38$
 $AB = 2(6) + 9 = 21$
 What do x and AB equal?
 $2x + 9 + 4x - 7 = 38$
 $6x + 2 = 38$
 $x = 6$ $AB = 21$

A $\frac{2x+9}{|}$ B $\frac{4x-7}{|}$ C
 38

5. Definition of a Midpoint:
 In the segment below,
 B is the midpoint of AC.
 $AB = 4x + 2$, $BC = 6x - 8$
 $AB = 4(5) + 2 = 22$
 What do x and AC equal?
 $x = 5$ $AC = 44$

A $\frac{4x+2}{|}$ B $\frac{6x-8}{|}$ C
 $4x + 2 = 6x - 8$
 $10 = 2x$

6. Graph the following lines.
 a. $x = 2$
 b. $y = 4$
 c. $y = x$ (Hint: this is $y = 1x + 0$)
 d. $y = -x$ (Hint: this is $y = -1x + 0$)

7. Classify the following angles:

Right \angle (with a square symbol)

Acute \angle (smaller than a right angle)

Obtuse \angle (larger than a right angle)

Straight \angle (180 degrees)

8. Angle Addition Postulate:
 $m\angle 1 = 7x - 2$
 $m\angle 2 = 5x + 5$
 $m\angle ABC = 75^\circ$
 What is x equal to?
 $x = 6$

SIDE NOTE: $m\angle 1$ is the shortcut way of writing "the measure of angle 1." It's like math texting - you write LOL instead of "laughing out loud," math people write $m\angle 1$ instead of "the measure of angle 1."

9. Angle Bisector:
 \overline{BD} bisects $\angle ABC$
 $m\angle 1 = 5x - 12$
 $m\angle 2 = 2x + 21$
 What are x and $m\angle ABC$?
 $x = 11$
 $m\angle ABC = 86^\circ$

Cuts in half parts

10. RS = 3x + 17, MN = 7x - 15
 $3x + 17 = 7x - 15$
 $32 = 4x$
 $8 = x$

11. RS = x + 10, MN = 2x + 4
 $x + 10 = 2x + 4$
 $6 = x$

For 10-11, suppose $\overline{RS} \cong \overline{MN}$. For each set, solve for x, and find the length of each segment.

10. RS = 3x + 17, MN = 7x - 15
 $3x + 17 = 7x - 15$
 $32 = 4x$
 $8 = x$

11. RS = x + 10, MN = 2x + 4
 $x + 10 = 2x + 4$
 $6 = x$

10. RS = 3x + 17, MN = 7x - 15
 $3x + 17 = 7x - 15$
 $32 = 4x$
 $8 = x$

11. RS = x + 10, MN = 2x + 4
 $x + 10 = 2x + 4$
 $6 = x$

10. RS = 3x + 17, MN = 7x - 15
 $3x + 17 = 7x - 15$
 $32 = 4x$
 $8 = x$

11. RS = x + 10, MN = 2x + 4
 $x + 10 = 2x + 4$
 $6 = x$

$2x$ $3x+1$ $4x-1$ $2x-1$
T U Z B T U B

12. Congruent (\cong) means "the same size and shape." Equal ($=$) refers to numerical values. Fill in the following blanks with \cong or $=$. Use the diagrams at the right to assist you.

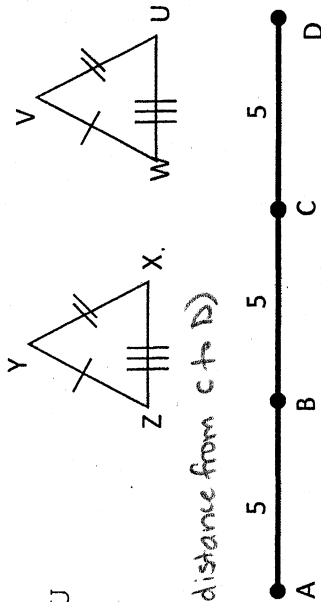
a. $4 + 6 = 10$

b. Triangle ZYX \cong Triangle WVU
 Note: this is typically written $\triangle ZYX \cong \triangle WVU$

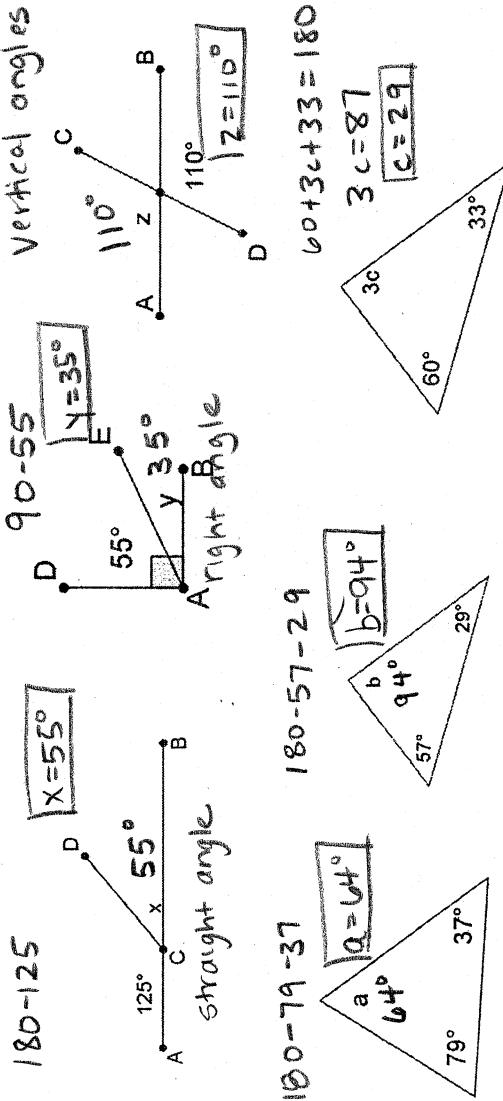
c. $4x + 8 = 4(x + 2)$

d. $AB = CD$

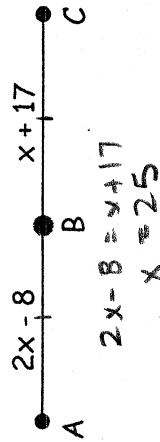
e. $\overline{AB} \cong \overline{CD}$



14. Given what you know about triangles, right angles, and straight angles, solve for the variables:



16. Let $\overline{AB} \cong \overline{BC}$.



$z(25) = 8$

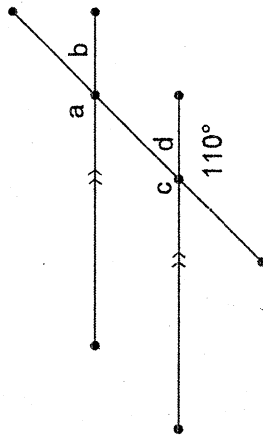
$x = \frac{25}{42}$ $AB = \frac{42}{42}$
 $BC = \frac{42}{42}$ $AC = \frac{84}{25+17}$

13. If U is between T and B, find the value of x and the lengths of the segments. (Hint: Draw a picture for each problem with the given information and then write the equation to solve.)
 **between implies "on the same line as the other 2 points."

a. $TU = 2x$, $UB = 3x + 1$, $TB = 21$ b. $TU = 4x - 1$, $UB = 2x - 1$, $TB = 5x$

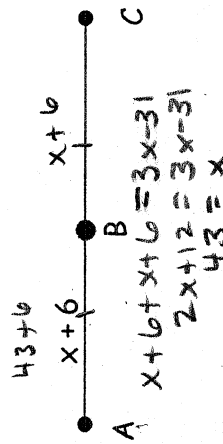
$x = \frac{4}{8}$ $x = \frac{2}{7}$
 $TU = 2(4) = 8$ $TU = 4(2) - 1 = 7$
 $UB = 3(4) + 1 = 13$ $UB = 2(2) - 1 = 3$
 $2x + 3x + 1 = 21$ $4x - 1 + 2x - 1 = 5x$
 $5x = 20$ $6x - 2 = 5x$
 $x = 4$ $x = 2$

15. The angles around parallel lines have some really interesting properties...can you figure them out? Find the values of a, b, c, and d.



Side Note:
 The little arrows on the two lines are Geometry notation for saying "these lines are parallel."

17. Let $\overline{AB} \cong \overline{BC}$, $AC = 3x - 31$



$x = 43$
 $AB = 49$
 $BC = 49$
 $AC = 98$

$43 + 6 = x + 6$
 $x + 6 + x + 6 = 3x - 31$
 $2x + 12 = 3x - 31$
 $43 = x$