Name: Solutions

1.2 Extension: Algebra with fractional coefficients

A check is required for all algebra solutions

1. Solve each equation for x.

(a) $\frac{1}{2}x = 8$ $*2$

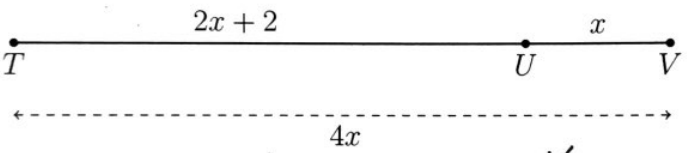
$x = 16$

(b) $\frac{1}{2}(x+5) = 8$ $*2$

$x+5 = 16$ -5

$x = 11$

2. As shown, three collinear points with $TU = 2x+2$, $UV = x$, $TV = 4x$. Find TV.



$(2x+2) + x = 4x$

combine terms

$3x + 2 = 4x$

$-3x$

$2 = x$

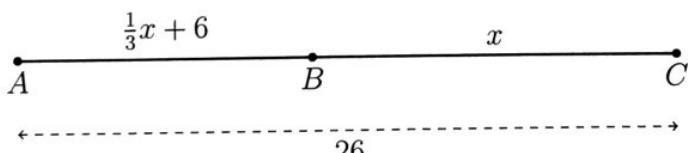
$TV = 4(2) = 8$

$TU = 2(2)+2 = 6$

$UV = 2$

$6+2 = 8$ ✓

3. As shown, three collinear points with $AB = \frac{1}{3}x + 6$, $BC = x$, $AC = 26$. Find x.



$\left(\frac{1}{3}x + 6\right) + x = 26$ $*3$

$x + 18 + 3x = 78$

$4x = 60$

$x = 15$

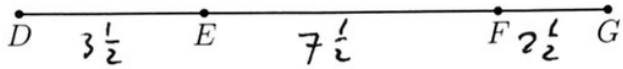
$AB = \frac{1}{3}(15)+6 = 11$

$BC = 15$

$11+15 = 26$ ✓

4. Given $\overline{DEFG}$, $DE = 3\frac{1}{2}$, $EF = 7\frac{1}{2}$, and $FG = 2\frac{1}{2}$.

Find DG, expressed as a fraction, not a decimal. *diagram not to scale*



$DG = 3\frac{1}{2} + 7\frac{1}{2} + 2\frac{1}{2} = 13\frac{1}{2}$

5. Find the value of each expression. (learn more by *not* using a calculator)

(a) $|2 - 13| =$ 11

(c) $|4 - (-2)| =$ 6

(b) $|10 + (-3)| =$ 7

(d) $|-5 - (-7)| =$ 2

6. Circle true or false for each statement.

(T) **F** There are two solutions for the equation $|x| = 9$, $x = 9$ and $x = -9$.

(T) **F** If x is negative, then $|x|$ must be positive.

T (F) If x is positive, then $|-x|$ is negative.

(T) **F** The value of $|x| + |3|$ is always positive.

7. Rewrite the equation $|x + 4| = 7$ two ways (positive and negative 7). Then solve both equations to find all values of x that satisfy $|x + 4| = 7$. (show the check for each solution)

(a) positive

$x + 4 = 7$

$x = 3$

$|(3) + 4| \stackrel{?}{=} 7$

$7 = 7$ ✓

(b) negative

$-(x + 4) = 7$

$x + 4 = -7$

$x = -11$

$|(-11) + 4| = 7$?

$|-7| = 7$ ✓