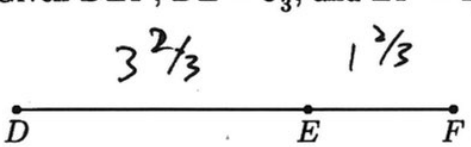
BECA / Dr. Huson / Geometry
Unit 1: Segments, length, and area
19 Sept 2022

Name: Solutions

1.7 Extension Quiz: Absolute value, trisection, algebra

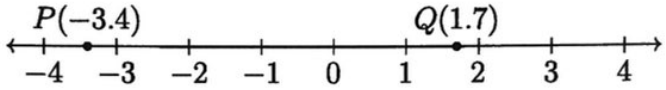
All algebraic solutions require a check for full credit.

1. Given $\overline{DEF}$, $DE = 3\frac{2}{3}$, and $EF = 1\frac{2}{3}$. Find DF.



$DF = 3\frac{2}{3} + 1\frac{2}{3} = 5\frac{1}{3}$

2. Given $P(-3.4)$ and $Q(1.7)$, as shown on the number line. Find the length of the line segment $\overline{PQ}$.



$PQ = 1.7 - (-3.4) = 5.1$

3. Given $x = -3$ simplify each expression.

(a) $|x - 2| =$ 5

(c) $|x - 1| + |x| =$ 7

(b) $|-1 - x| =$ 2

(d) $3 \times |-x| + x =$ 6

4. Find all values of x satisfying the equation. (show the two cases for each problem)

(a) $|2x| = 8$

$2x = 8$ $\quad$ $2x = -8$

$x = 4$ $\quad$ $x = -4$

$|2(4)| = 8$ ✓ $\quad$ $|2(-4)| = 8$ ✓

(b) $|x - 2| + 2 = 7$

$|x-2| = 5$

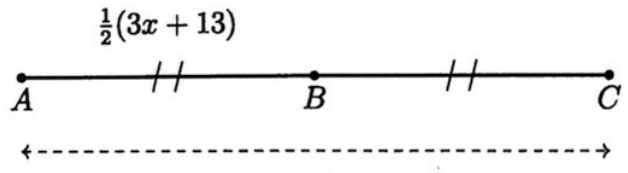
$x - 2 = 5$ $\quad$ $x - 2 = -5$

$x = 7$ $\quad$ $x = -3$

$|7-2| + 2 = 7$ $\quad$ $|-3-2| + 2 = 7$

$5 + 2 = 7$ ✓ $\quad$ $|-5| + 2 = 7$ ✓

5. The segment $\overline{AC}$ is bisected by point B, $AB = \frac{1}{2}(3x + 13)$ and $AC = 22$. Find x.



$\frac{1}{2}(3x+13) = \frac{1}{2}(22) = 11$

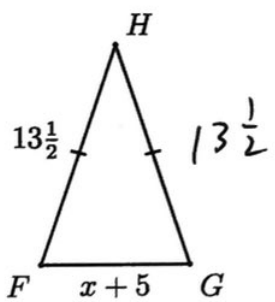
$3x + 13 = 22$

$x = 3$

$\frac{1}{2}(3(3)+13) = \frac{1}{2}(22)$?

$\frac{1}{2}(22) = \frac{1}{2}(22)$ ✓

6. The perimeter of the isosceles $\triangle FGH$ is 35 with $\overline{FH} \cong \overline{GH}$. If $FG = x + 5$ and $FH = 13\frac{1}{2}$, find x.



$x + 5 = 8$

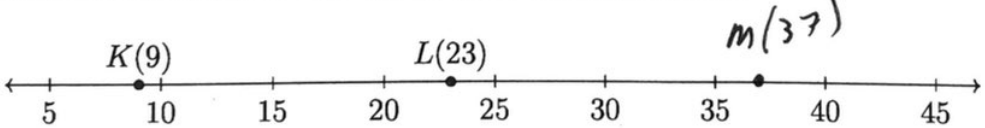
$P = 2(13\frac{1}{2}) + (x+5) = 35$

$32 + x = 35$

$x = 3$

$2(13\frac{1}{2}) + 8 = 35$ ✓

7. Given points $K(9)$ and $L(23)$, find the value of M such that L is the bisector of $\overline{KM}$. Mark M and label it with its value on the number line.



$KL = 23 - 9 = 14$

$M = L + 14 = 37$

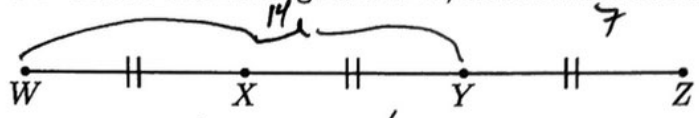
(23)

check

$KM = 37 - 9 = 28$

$28 = 2(14)$ ✓

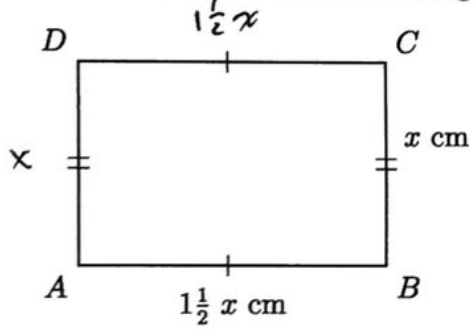
8. The points X and Y trisect the line segment $\overline{WZ}$, as shown below. If $WY = 14$, find WZ.



$WX = \frac{1}{2} WY = \frac{1}{2}(14) = 7$

$WZ = 3\,WX = 3(7) = 21$

9. The perimeter of rectangle $ABCD$ is 70 centimeters and its length is one and a half times its width. Find the rectangle's dimensions.



$P = 2(1\frac{1}{2}x) + 2(x) = 70$

$5x = 70$

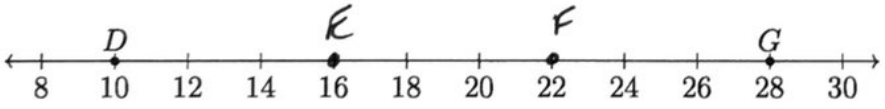
$x = 14$

$AB = 1\frac{1}{2}(14) = 21$

14×21 cm

Check $P = 2(21) + 2(14) = 70$ ✓

10. Given $\overleftrightarrow{DG}$ as shown on the number line, with $D = 10$ and $G = 28$.



Points E and F trisect $\overline{DG}$. Find the values of E and F and mark and label them on the number line $\overleftrightarrow{DG}$.

$DG = 28 - 10 = 18$

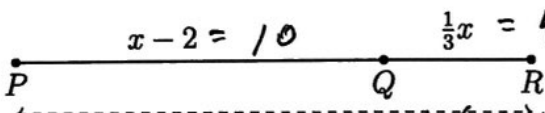
$\frac{1}{3} DG = \frac{1}{3}(18) = 6$

$E = 10 + 6 = 16$

$F = 16 + 6 = 22$

Check $G = 22 + 6 = 28$ ✓

11. Given $\overline{PQR}$, $PQ = x - 2$, $QR = \frac{1}{3}x$, $PR = \frac{1}{3}(3x + 6)$. Find x.



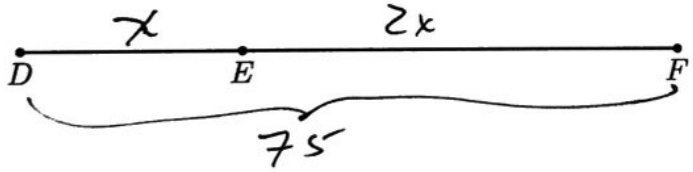
$(x-2) + \frac{1}{3}x = \frac{1}{3}(3x+6)$

$10 + 4 = 14$ ✓

$3x - 6 + x = 3x + 6$

$x = 12$

12. Given $\overline{DEF}$, $DF = 75$ and $\overline{DE}$ is half the length of $\overline{EF}$. Find DE.



$x + 2x = 75$

$x = 25$

$DE = 25$

$25 + 50 = 75$ ✓

Academic integrity pledge

This assignment must be completed in one sitting. Use your notes and a calculator.

I have not received any human help on this assignment.

Signed: _____ _____

Date, start time - end time