

# Unit One Spiral - The Basics

1.  $EF = 1 \text{ cm}$

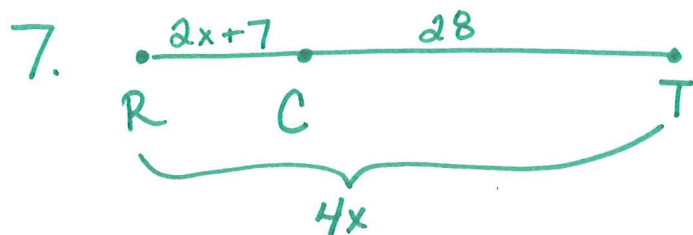
2.  $FH = 3 + 2 = 5 \text{ cm}$

3.  $HE = 3 + 2 + 1 = 6 \text{ cm}$

4.  $DG = 2 + 1 + 3 = 6 \text{ cm}$

5.  $EG = 2.4 + 1.3 = 3.7 \text{ cm}$

6.  $BC = 8.5 - 3 = 5.5 \text{ cm}$



$RT = RC + CT$  segment addition

$4x = 2x + 7 + 28$  substitution

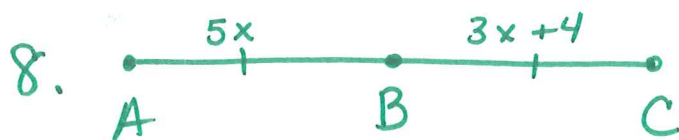
$4x = 2x + 35$  CLT

$2x = 35$  subtraction

$x = \frac{35}{2}$  division

$RT = 4x$   
 $= 4\left(\frac{35}{2}\right)$

$= 70 \text{ units}$



$AB = BC$  def. of midpoint.

$5x = 3x + 4$  substitution

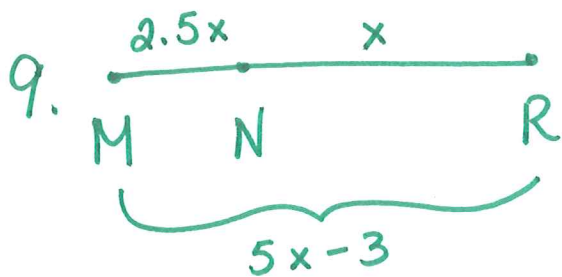
$2x = 4$  subtraction

$x = 2$  division

$AB = 5x$   
 $= 5(2) = 10 \text{ units}$

$BC = 3x + 4$   
 $= 3(2) + 4 = 10 \text{ units}$

$AC = AB + BC$   
 $= 10 + 10 = 20 \text{ units}$



$$MN = 2.5x$$

$$= 2.5(2) = \boxed{5 \text{ units}}$$

$$NR = x$$

$$= \boxed{2 \text{ units}}$$

$$MR = 5x - 3$$

$$= 5(2) - 3 = \boxed{7 \text{ units}}$$

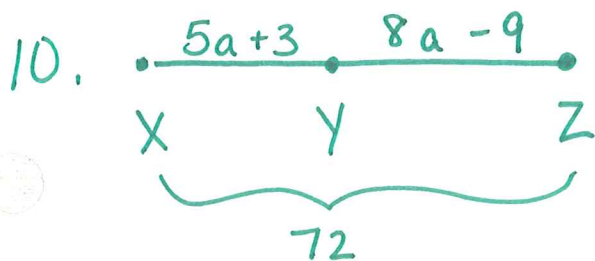
$MR = MN + NR$  segment addition

$$5x - 3 = 2.5x + x \quad \text{substitution}$$

$$5x - 3 = 3.5x \quad \text{CLT}$$

$$-3 = -1.5x \quad \text{subtraction}$$

$$2 = x \quad \text{division}$$



$$XY = 5a + 3$$

$$= 5(6) + 3$$

$$= 33 \text{ units}$$

$$YZ = 8a - 9$$

$$= 8(6) - 9$$

$$= 39 \text{ units}$$

$XZ = XY + YZ$  segment addition

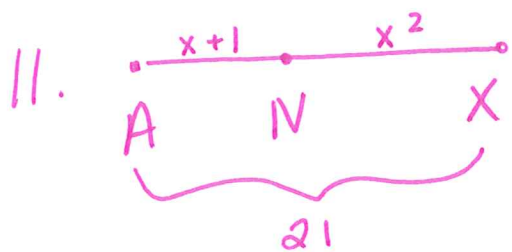
$$72 = 5a + 3 + 8a - 9 \quad \text{substitution}$$

$$72 = 13a - 6 \quad \text{CLT}$$

$$78 = 13a \quad \text{addition}$$

$$6 = a \quad \text{division}$$

No, Y is not the midpoint of  $\overline{XZ}$  because  $\overline{XY}$  is not  $\cong$  to  $\overline{YZ}$



$AX = AN + NX$  segment addition  
 $21 = x + 1 + x^2$  substitution

$0 = x^2 + x - 20$  subtraction

$0 = (x + 5)(x - 4)$  factoring

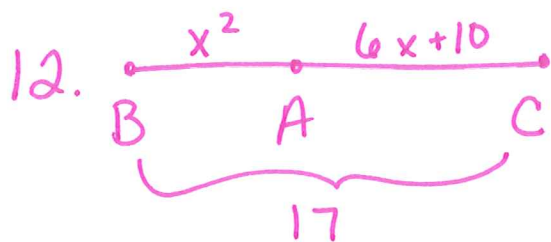
$x + 5 = 0$        $x - 4 = 0$       set equal to 0

~~$x = -5$~~        $x = 4$

$AX = 21$  units

$AN = 4 + 1 = 5$  units

$NX = 4^2 = 16$  units



$BC = BA + AC$  segment addition  
 $17 = x^2 + 6x + 10$  substitution

$0 = x^2 + 6x - 7$  subtraction

$0 = (x + 7)(x - 1)$  factor

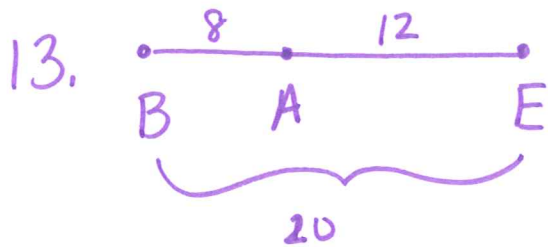
$x + 7 = 0$        $x - 1 = 0$       set equal to 0

~~$x = -7$~~        $x = 1$

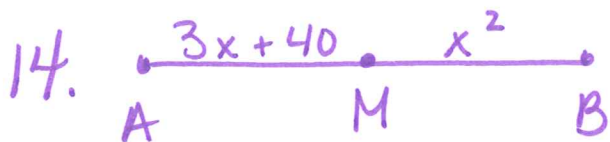
$BC = 17$  units

$BA = 1^2 = 1$  unit

$AC = 6(1) + 10 = 16$  units



$\overline{BE}$  has to be the longest because it has the longest length  $\therefore$  A goes between



$AM = MB$  def. of midpoint

$3x+40 = x^2$  substitution

$-x^2 + 3x + 40 = 0$  subtraction

$x^2 - 3x - 40 = 0$  division

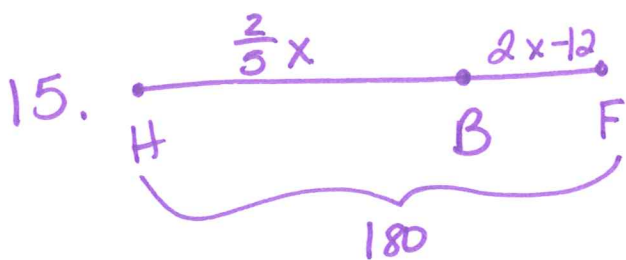
$(x+5)(x-8) = 0$  factor

$x+5=0$   $x-8=0$  set equal to 0

~~$x = -5$~~   $x = 8$

$AM = 3(8) + 40$   
 $= 64 \text{ units}$

$MB = 64 \text{ units}$   
 $= 8^2$



$HF = HB + BF$  segment addition

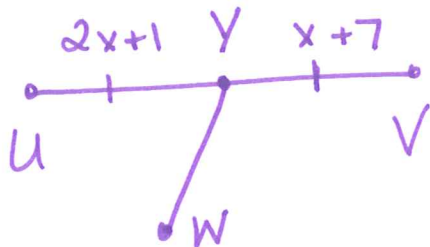
$180 = \frac{2}{3}x + 2x - 12$  substitution

$180 = \frac{12}{5}x - 12$  CLT

$192 = \frac{12}{5}x$  addition

$80 = x$  multiplication

16.



$$UY = UV$$

$$2x+1 = x+7$$

$$x+1 = 7$$

$$x = 6$$

def. of bisector  
substitution  
subtraction  
subtraction

$$UY = 2(6)+1$$

$$= 13 \text{ units}$$

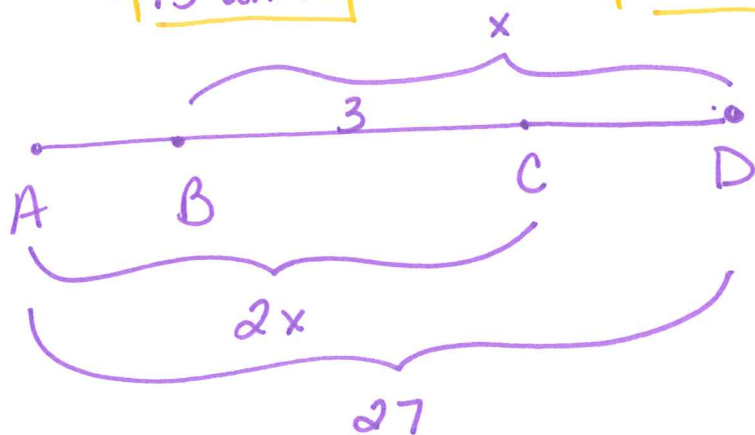
$$YV = 6+7$$

$$= 13 \text{ units}$$

$$UV = 13+13$$

$$= 26 \text{ units}$$

17.



$$BD = x = 10 \text{ units}$$

$$(AC - BC) + BD = AD \quad \text{segment addition}$$

$$(2x - 3) + x = 27 \quad \text{substitution}$$

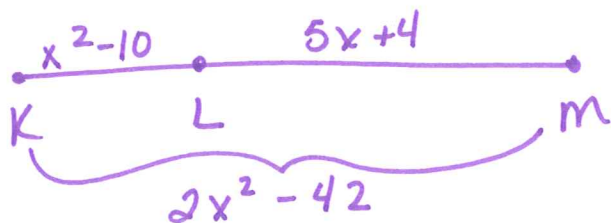
$$2x - 3 + x = 27$$

$$3x - 3 = 27 \quad \text{CLT}$$

$$3x = 30 \quad \text{addition}$$

$$x = 10 \quad \text{division}$$

18.



$$KM = KL + LM \quad \text{segment addition}$$

$$2x^2 - 42 = x^2 - 10 + 5x + 4 \quad \text{substitution}$$

$$2x^2 - 42 = x^2 + 5x - 6 \quad \text{CLT}$$

$$x^2 - 42 = 5x - 6 \quad \text{subtraction}$$

$$x^2 - 5x - 42 = -6 \quad \text{subtraction}$$

$$x^2 - 5x - 36 = 0 \quad \text{addition}$$

$$(x+4)(x-9) = 0 \quad \text{factor}$$

$$x+4 = 0 \quad x-9 = 0$$

$$x = -4 \quad x = 9$$



$$19. \left( \frac{2+x}{2}, \frac{6+y}{2} \right) = (-1, 1)$$

$$\frac{2+x}{2} = -1 \quad \frac{6+y}{2} = 1$$

$$2+x = -2 \quad 6+y = 2$$
$$x = -4 \quad y = -5$$

$$(-4, -5)$$

$$20. \left( \frac{-8+x}{2}, \frac{-1+y}{2} \right) = (0, 3)$$

$$\frac{-8+x}{2} = 0 \quad \frac{-1+y}{2} = 3$$

$$-8+x = 0 \quad -1+y = 6$$
$$x = 8 \quad y = 7$$

$$(8, 7)$$

$$21. \left( \frac{3+x}{2}, \frac{-12+y}{2} \right) = (2, -1)$$

$$\frac{3+x}{2} = 2 \quad \frac{-12+y}{2} = -1$$

$$3+x = 4 \quad -12+y = -2$$
$$x = 1 \quad y = 10$$

$$(1, 10)$$

$$22. \left( \frac{-5+x}{2}, \frac{9+y}{2} \right) = (-8, -2)$$

$$\frac{-5+x}{2} = -8$$

$$-5+x = -16$$

$$x = -11$$

$$\frac{9+y}{2} = -2$$

$$9+y = -4$$

$$y = -13$$

$$(-11, -13)$$

$$23. \left( \frac{6+x}{2}, \frac{7+y}{2} \right) = (10, -7)$$

$$\frac{6+x}{2} = 10$$

$$6+x = 20$$

$$x = 14$$

$$\frac{7+y}{2} = -7$$

$$7+y = -14$$

$$y = -21$$

$$(14, -21)$$

$$24. \left( \frac{-3.5+x}{2}, \frac{-6+y}{2} \right) = (1.5, 4.5)$$

$$\frac{-3.5+x}{2} = 1.5$$

$$-3.5+x = 3$$

$$x = 6.5$$

$$\frac{-6+y}{2} = 4.5$$

$$-6+y = 9$$

$$y = 15$$

$$(6.5, 15)$$