

# Unit One Spiral - The BASICS

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

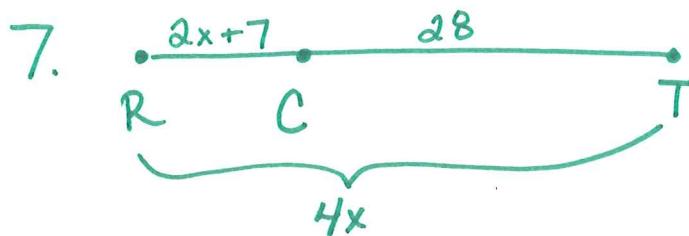
$$2. FH = 3 + 2 = \boxed{5 \text{ cm}}$$

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

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

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

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



$$\begin{aligned} RT &= 4x \\ &= 4\left(\frac{35}{2}\right) \\ &= \boxed{70 \text{ units}} \end{aligned}$$

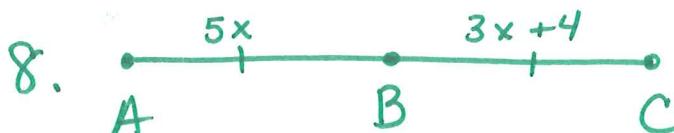
$RT = RC + CT$  segment addition

$$4x = 2x + 7 + 28 \quad \text{substitution}$$

$$4x = 2x + 35 \quad \text{CLT}$$

$$2x = 35 \quad \text{subtraction}$$

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



$AB = BC$  def. of midpoint.

$$5x = 3x + 4 \quad \text{substitution}$$

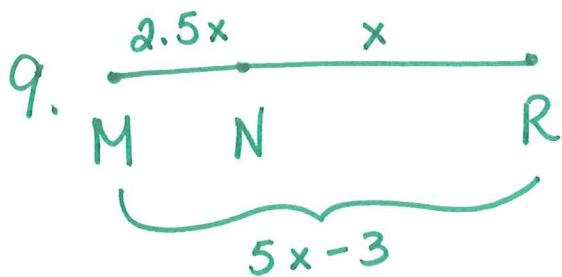
$$2x = 4 \quad \text{subtraction}$$

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

$$\begin{aligned} AB &= 5x \\ &= 5(2) = \boxed{10 \text{ units}} \end{aligned}$$

$$\begin{aligned} BC &= 3x + 4 \\ &= 3(2) + 4 = \boxed{10 \text{ units}} \end{aligned}$$

$$\begin{aligned} AC &= AB + BC \\ &= 10 + 10 = \boxed{20 \text{ units}} \end{aligned}$$



$$\begin{aligned} MN &= 2.5x \\ &= 2.5(2) = \boxed{5 \text{ units}} \end{aligned}$$

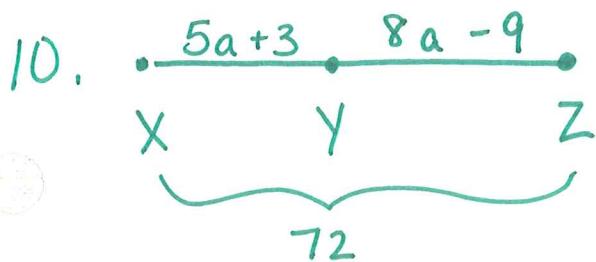
$$MR = MN + NR \quad \text{segment addition}$$

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

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

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

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



$$\begin{aligned} MR &= 5x - 3 \\ &= 5(2) - 3 = \boxed{7 \text{ units}} \end{aligned}$$

$$XZ = XY + YZ \quad \text{segment addition}$$

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

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

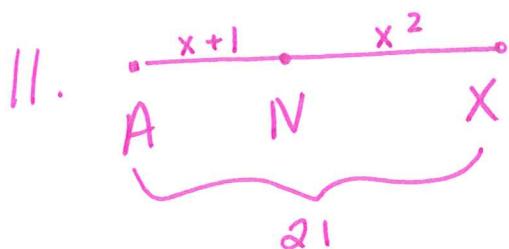
$$78 = 13a \quad \text{addition}$$

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

$$\begin{aligned} XY &= 5a + 3 \\ &= 5(6) + 3 \\ &= 33 \text{ units} \end{aligned}$$

$$\begin{aligned} YZ &= 8a - 9 \\ &= 8(6) - 9 \\ &= 39 \text{ units} \end{aligned}$$

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



$$AX = AN + NX \quad \text{segment addition}$$

$$21 = x+1 + x^2 \quad \text{substitution}$$

$$0 = x^2 + x - 20 \quad \text{subtraction}$$

$$0 = (x+5)(x-4) \quad \text{factoring}$$

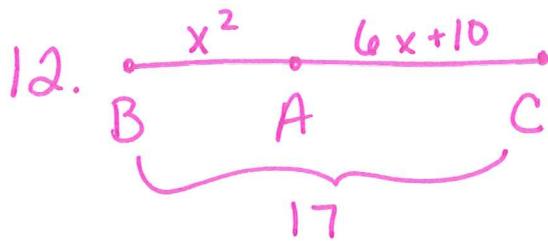
$$x+5=0 \quad x-4=0 \quad \text{set equal to 0}$$

$$\cancel{x=-5} \quad \boxed{x=4}$$

$$AX = \boxed{21 \text{ units}}$$

$$AN = 4+1 = \boxed{5 \text{ units}}$$

$$NX = 4^2 = \boxed{16 \text{ units}}$$



$$BC = BA + AC \quad \text{segment addition}$$

$$17 = x^2 + 6x + 10 \quad \text{substitution}$$

$$0 = x^2 + 6x - 7 \quad \text{subtraction}$$

$$0 = (x+7)(x-1) \quad \text{factor}$$

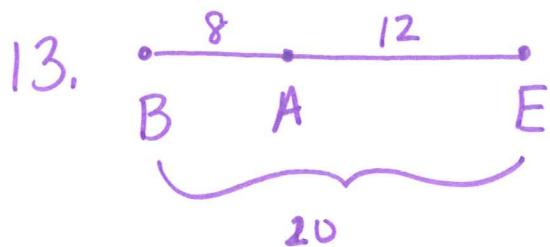
$$x+7=0 \quad x-1=0 \quad \text{set equal to 0}$$

$$\cancel{x=-7} \quad \boxed{x=1}$$

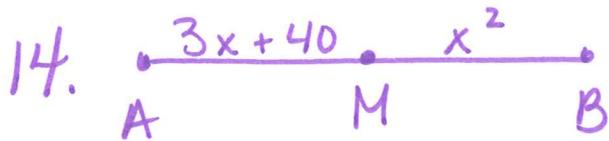
$$BC = \boxed{17 \text{ units}}$$

$$BA = 1^2 = \boxed{1 \text{ unit}}$$

$$AC = 6(1) + 10 = \boxed{16 \text{ units}}$$



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



$$AM = MB \quad \text{def. of midpoint}$$

$$3x + 40 = x^2 \quad \text{substitution}$$

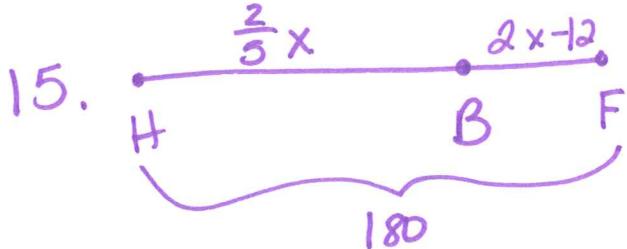
$$-x^2 + 3x + 40 = 0 \quad \text{subtraction}$$

$$x^2 - 3x - 40 = 0 \quad \text{division}$$

$$(x+5)(x-8) = 0 \quad \text{factor}$$

$$x+5=0 \quad x-8=0 \quad \text{set equal to 0}$$

$$\cancel{x=5} \quad \boxed{x=8}$$



$$HF = HB + BF \quad \text{segment addition}$$

$$180 = \frac{2}{5}x + 2x - 12 \quad \text{substitution}$$

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

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

$$\boxed{80 = x} \quad \text{multiplication}$$

16.

$$UY = UV \quad \text{def. of bisector}$$

$$2x+1 = x+7 \quad \text{substitution}$$

$$x+1 = 7 \quad \text{subtraction}$$

$$\boxed{x=6} \quad \text{subtraction}$$

$$UY = 2(6) + 1 \\ = 13 \text{ units}$$

$$YV = 6+7 \\ = 13 \text{ units}$$

$$UV = 13+13$$

$$= 26 \text{ units}$$

17.

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

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

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

$$2x - 3 + x = 27 \quad \text{CLT}$$

$$3x - 3 = 27$$

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

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

18.

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

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

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

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

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

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

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

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

$$x = -4$$

$$\boxed{x=9}$$

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

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

(-4, -5)

$$\begin{aligned} 2+x &= -2 & 6+y &= 1 \\ x &= -4 & y &= -5 \end{aligned}$$

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

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

(8, 7)

$$\begin{aligned} -8+x &= 0 & -1+y &= 6 \\ x &= 8 & y &= 7 \end{aligned}$$

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

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

(1, 10)

$$\begin{aligned} 3+x &= 4 & -12+y &= -2 \\ x &= 1 & y &= 10 \end{aligned}$$

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

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

$$-5+x = -16$$

$$x = -11$$

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

$$9+y = -4$$

$$y = -13$$

(-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)