Geometry H : 6.3 Homework

4-8 : $BCDE \sim WXYZ$ so $\frac{BC}{WX} = \frac{CD}{XY} = \frac{DE}{YZ} = \frac{BE}{WZ}$

④ scale factor: $\frac{BCDE}{WXYZ} : \frac{BC}{WX} = \frac{4}{6} = \boxed{\frac{2}{3}}$

⑤ Scale factor: $\frac{WXYZ}{BCDE} : \frac{WX}{BC} = \frac{6}{4} = \boxed{\frac{3}{2}}$

⑥ Find XY → Locate a pair of corresponding sides ; use scale factor to set up proportion

$\frac{CD}{XY}$ = scale factor

$\frac{BCDE}{WXYZ} : \frac{3}{XY} = \frac{2}{3} \Rightarrow \frac{9}{2} = \frac{2(XY)}{2} \Rightarrow \boxed{XY = 4.5}$

⑦ $m\angle C$: Angle C and angle X are corresponding angles

so $\boxed{m\angle C = 117°}$

⑧ Find perim of WXYZ: the perim of BCDE = 16 units by adding all sides together

$\frac{BCDE}{WXYZ} : \frac{2}{3} = \frac{16}{X} \Rightarrow 2X = 48 \Rightarrow X = 24$

scale factor — perimeters

$\boxed{\text{So perim of } WXYZ = 24 \text{ units}}$

⑪ Write a proportion to find WX in terms of the side lengths r, s, t, u & v

$\frac{KN}{WZ}$ ← both of these have r, s, t, u or v values, so we can use $\frac{KN}{WZ}$ as our "comparison"

$\frac{KN}{WZ} = \frac{KL}{WX}$ } the corresponding sides that involve the "unknown" side

$\frac{u}{v} = \frac{r}{WX} \Rightarrow \frac{rv}{u} = \frac{u(WX)}{u} \Rightarrow WX = \frac{rv}{u}$

(15) $\Delta PQR \sim \Delta STU \Rightarrow \frac{PQ}{ST} = \frac{QR}{TU} = \frac{PR}{SU}$

$\frac{PQ}{ST} = \frac{PR}{SU} \Rightarrow \frac{13-x}{7-x} = \frac{x^2+20}{x^2+5}$

$(13-x)(x^2+5) = (7-x)(x^2+20)$ FOIL these!

$13x^2+65-x^3-5x = 7x^2+140-x^3-20x$

$13x^2+65-5x = 7x^2+140-20x$ ← get all x^2's on one side and all other terms on the same side as the x^2's

$6x^2+65-5x = 140-20x$

$6x^2+65+15x = 140$

$6x^2-75+15x = 0$

$6x^2+15x-75 = 0$ ← use Quad formula OR factoring to solve

$\frac{3(2x^2+5x-25)}{3} = \frac{0}{3}$ ← take out common factor of 3

$2x^2+5x-25 = 0$ ← I factored by grouping

$2x^2+10x-5x-25 = 0$

$2x(x+5)-5(x+5) = 0$

$(2x-5)(x+5) = 0$

$2x-5 = 0$ or $x+5 = 0$

$\boxed{x = 5/2}$ or $\boxed{x = -5}$ ← check both of these back in your side lengths to make sure your side lengths end up being positive

PQ: $13-5/2 = 10.5$ or $13--5 = 18$ ✓

ST: $7-5/2 = 4.5$ or $7--5 = 12$ ✓

PR: $(\frac{5}{2})^2+20 = 26.25$ or $(-5)^2+20 = 45$ ✓

SU: $(\frac{5}{2})^2+5 = 11.25$ or $(-5)^2+5 = 30$ ✓