Geometry
Test Review – Similarity

Name: Key
Date: _____

1. Given that $\Delta MAX \sim \Delta IZY$. Complete the following:

a. $\angle M \cong$ $\angle I$ b. $\frac{AX}{ZY} = \frac{XM}{YI}$ c. $\angle Z \cong$ $\angle A$ d. $\Delta ZIY \cong$ ΔAMX

2. Given $\Delta LMN \sim \Delta PQR$. Complete the following:

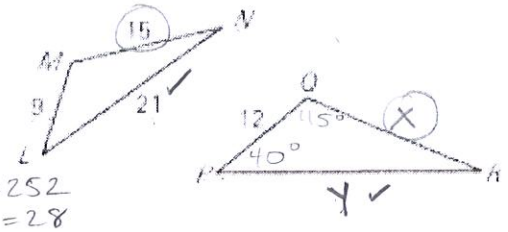
a. Scale factor of ΔLMN to ΔPQR. $\frac{9}{12} = \frac{3}{4}$

$\frac{9}{12} = \frac{15}{x}$

$9x = 180$

$x = 20$

b. QR = 20 and PR = 28. $\frac{9}{12} = \frac{21}{Y}$ $9Y = 252$ $Y = 28$



c. What is the ratio of the perimeters? $\frac{3}{4}$

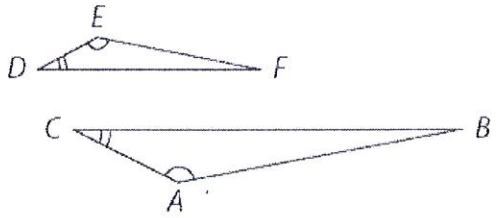
d. If $m\angle P = 40°$ and $m\angle Q = 115°$, then $m\angle R =$ 25°, $m\angle L =$ 40°, and $m\angle M =$ 115°

3. If two polygons are similar, the ratio of their areas is equal to the square of the scale factor.

$\left(\frac{3}{4}\right)^2$ Area $= \frac{9}{16}$

4. Write a similarity statement.

$\Delta DEF \sim \Delta CAB$



5. Which theorems are used to prove that two triangles are similar?

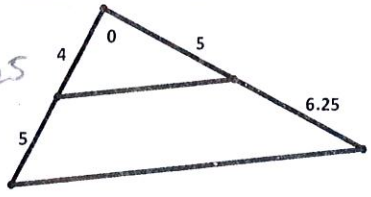
SSS~, SAS~, AA~

6. Are the following pairs of triangles similar? If they are, then name their similarity criteria. (SSS~, SAS~, AA~)

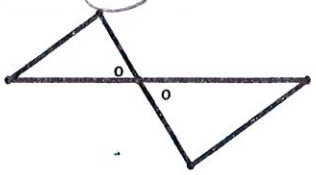
a) (Yes) / No SAS~

$\frac{4}{5} = \frac{5}{6.25}$

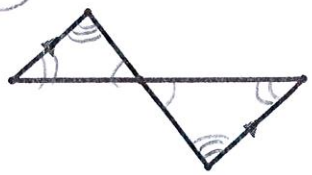
$.8 = .8$ ✓



b) Yes / (No)

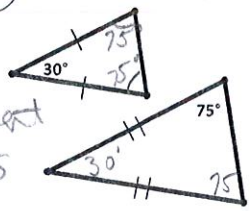


c) (Yes) / No AA~

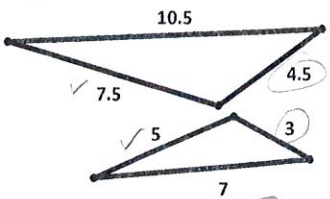


d) (Yes) / No SAS~

Isosceles Triangles have congruent base angles

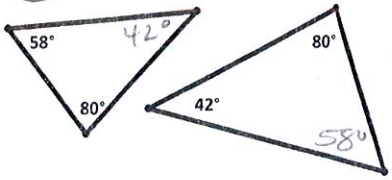


e) (Yes) / No SSS~

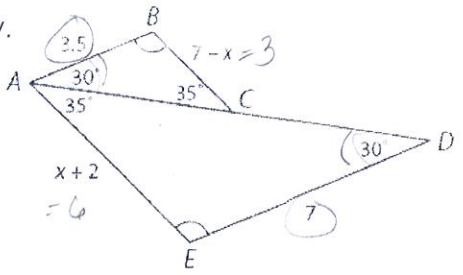


$\frac{3}{4.5} = \frac{5}{7.5} = \frac{7}{10.5} = .667$

f) (Yes) / No AA~



7. Find x and the length of the missing sides in the diagram below.



$\frac{3.5}{7} = \frac{7-x}{x+2}$

$3.5(x+2) = 7(7-x)$

$3.5x + 7 = 49 - 7x$

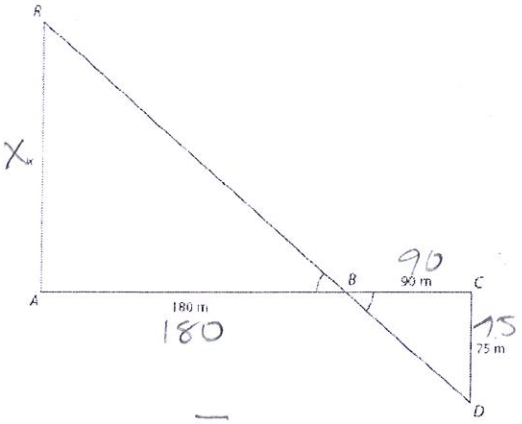
$10.5x = 42$

$\boxed{x = 4}$

$AE = 4+2 = 6$

$BC = 7-4 = 3$

8. Finding the distance across a canyon can often be difficult. A drawing of similar triangles can be used to make this task easier. Use the diagram to determine $\overline{AR}$, the distance across the canyon.



$\overline{AC}$

$\frac{90}{180} = \frac{75}{x}$

$90x = 13{,}500$

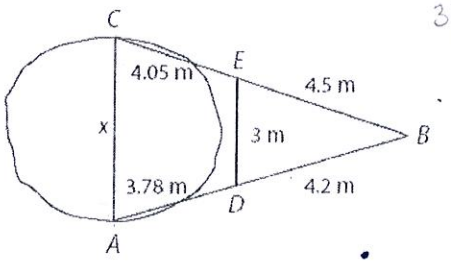
$\boxed{x = 150\text{ m}}$

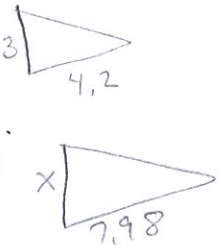
9. To measure ~~$\overline{BC}$~~ $\overline{AC}$, the distance across a crater, an archaeologist stands at point A and locates points B, C, D, and E. What is the distance across the crater?

$\frac{3}{x} = \frac{4.2}{7.98}$

$4.2x = 23.94$

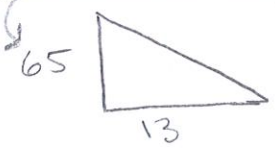
$\boxed{x = 5.7\text{ m}}$

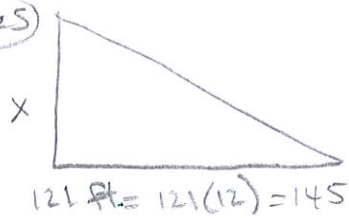




10. Rebecca is 5 feet 5 inches tall and is standing near the Space Needle in Seattle, Washington. She casts a 13 inch shadow at the same time that the Space Needle casts a 121 foot shadow. How tall is the Space Needle?

(5 ft 5 in = 5(12)+5 = 65 inches)





121 ft = 121(12) = 1452 in

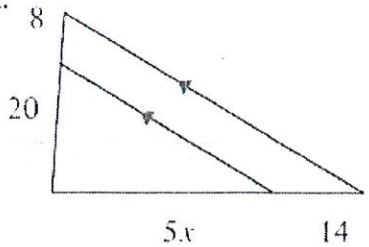
$\frac{x}{65} = \frac{1452}{13}$

$13x = 94380$

$x = 7260\text{ in}$

or $\frac{7260}{12} = \boxed{605\text{ ft.}}$

11. Find x.

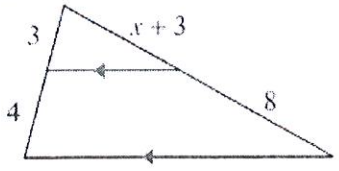


$\frac{8}{20} = \frac{14}{5x}$

$40x = 280$

$\boxed{x = 7}$

12. Find x.



$\frac{3}{4} = \frac{x+3}{8}$

$24 = 4(x+3)$

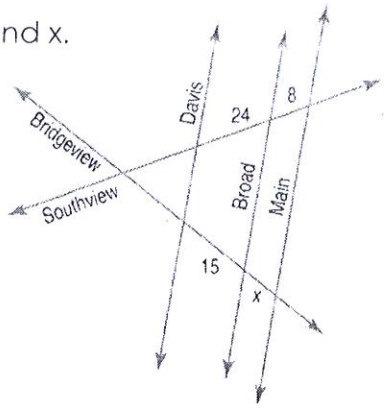
$24 = 4x + 12$

$12 = 4x$

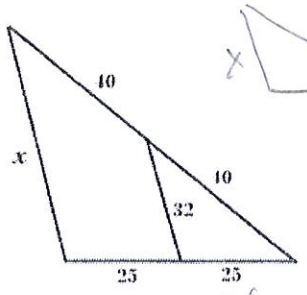
$\boxed{x = 3}$

13. Davis, Broad, and Main Streets are parallel. Find x.

$\frac{x}{15} = \frac{8}{24}$ $24x = 120$ $\boxed{x = 5}$



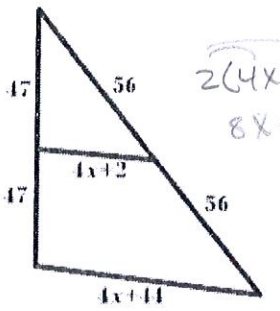
14. Find the value of x.



$\frac{x}{32} = \frac{80}{40}$ $40x = 2560$ $\boxed{x = 64}$

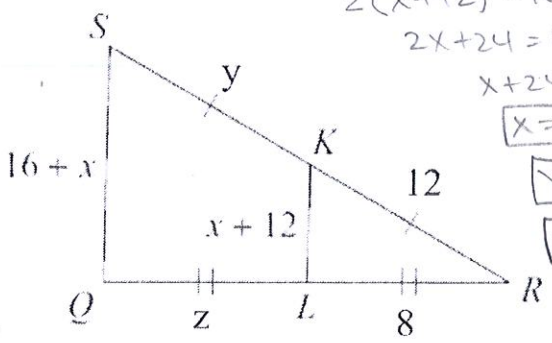
If you know sides are proportional, multiply 32 (2) to get x. So x = 64

15. Find the length of the midsegment.



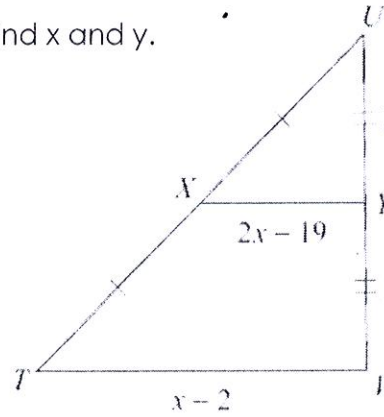
$2(4x+2) = 4x+44$
$8x+4 = 4x+44$
$4x = 40$
$\boxed{x = 10}$
$4(10)+2 = \boxed{42}$

16. Find x, y, and z.



$2(x+12) = 16+x$
$2x+24 = 16+x$
$x+24 = 16$
$\boxed{x = -8}$
$\boxed{y = 12}$
$\boxed{z = 8}$

17. Find x and y.

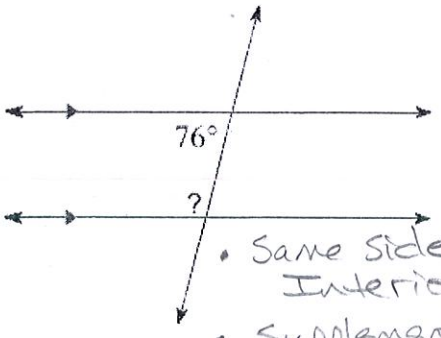


$2(2x-19) = x-2$
$4x-38 = x-2$
$3x-38 = -2$
$3x = 36$
$\boxed{x = 12}$

$2y+1 = y+11$
$y+1 = 11$
$\boxed{y = 10}$

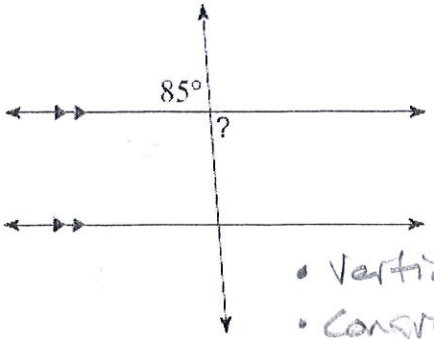
For numbers 18 – 25, name the angle pair, whether they are congruent or supplementary, and then solve for x or the missing angle.

18.



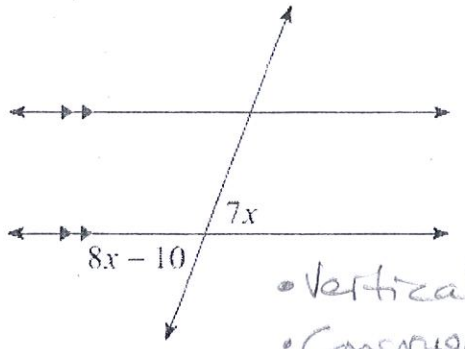
- Same Side Interior
- Supplamentary
- 180 − 76 = 104°

19.



- Vertical Angles
- Congruent
- 85°

20.



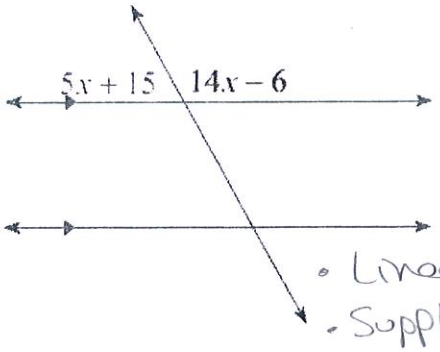
- Vertical Angles
- Congruent

$8x - 10 = 7x$

$-10 = -1x$

$\boxed{x = 10}$

21.



- Linear Pair
- Supplementary

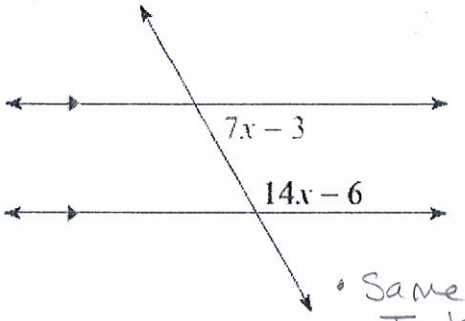
$5x + 15 + 14x - 6 = 180$

$19x + 9 = 180$

$19x = 171$

$\boxed{x = 9}$

22.



- Same Side Interior
- Supplementary

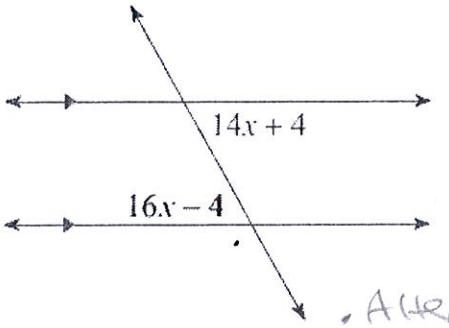
$7x - 3 + 14x - 6 = 180$

$21x - 9 = 180$

$21x = 189$

$\boxed{x = 9}$

23.



- Alternate Interior Angles
- Congruent

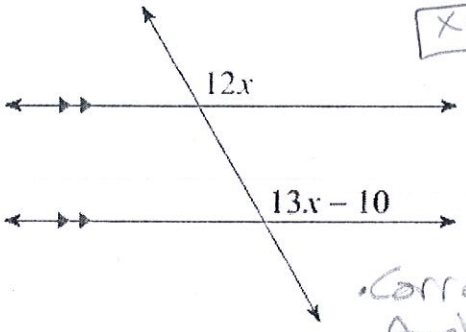
$14x + 4 = 16x - 4$

$4 = 2x - 4$

$8 = 2x$

$\boxed{x = 4}$

24.



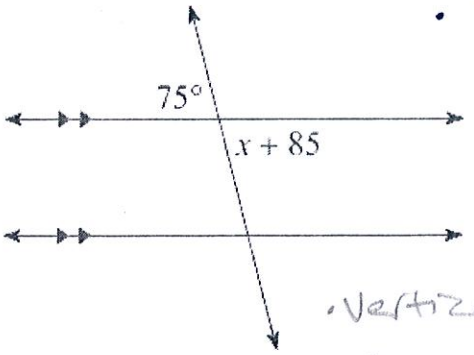
- Corresponding Angles
- Congruent

$12x = 13x - 10$

$-x = -10$

$\boxed{x = 10}$

25.



- Vertical Angles
- Congruent

$75 = x + 85$

$\boxed{x = -10}$