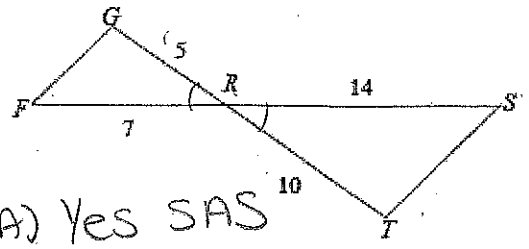
Final Exam Review Part III:

Small medium large
Small = medium = large

Similar Triangles

(A) State if the triangle are similar by choosing AA, SAS, SSS, or not similar. (B) If they are similar, complete the similarity statement.

1)



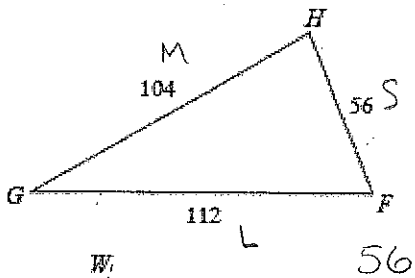
(A) Yes SAS

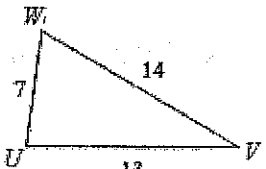
(B) $\triangle RST \sim \triangle RFG$

$\frac{5}{10} = \frac{7}{14}$

$\frac{1}{2} = \frac{1}{2}$ ✓

2)





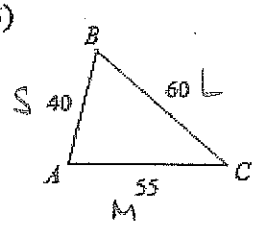
$\frac{56}{7} = \frac{104}{13} = \frac{112}{14}$

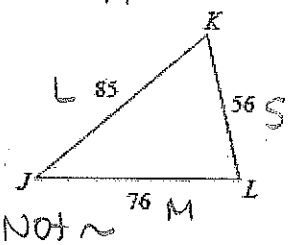
$8 = 8 = 8$ ✓

(A) Yes, SSS

(B) $\triangle FGH \sim \triangle NVW$

3)





$\frac{40}{56} = \frac{55}{76} = \frac{60}{85}$

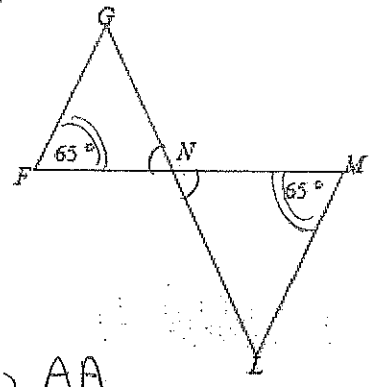
$.714 = .723 = .706$

NOT Similar

(A) Not ~

(B) ~~$\triangle LKJ$~~

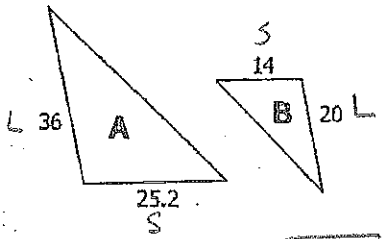
4)



(A) AA

(B) $\triangle NML \sim \triangle NFG$

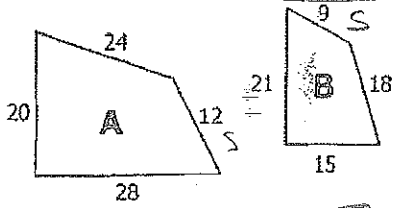
5. Find the scale factor of Figure A to Figure B.



$\frac{36}{20} = \frac{9}{5}$

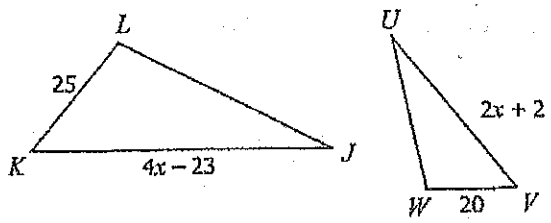
6. Find the scale factor of Figure B to Figure A.

** Scale factors are FRACTIONS **



$\frac{9}{12} = \frac{3}{4}$

7. If $\Delta KLJ \sim \Delta VWU$, find the value of x.



$\frac{25}{20} = \frac{4x-23}{2x+2}$

$25(2x+2) = 20(4x-23)$

$50x + 50 = 80x - 460$

$-50x \quad -50x$

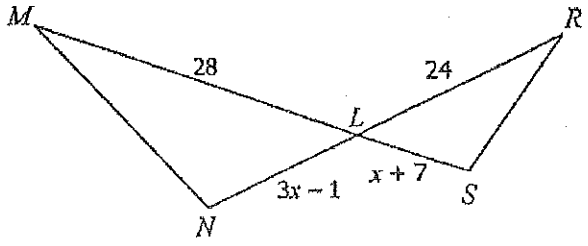
$50 = 30x - 460$

$+460 \quad +460$

$\frac{510}{30} = \frac{30x}{30}$

$x = 17$

8. If $\Delta NML \sim \Delta SRL$ find the value of x.



$\frac{28}{24} = \frac{3x-1}{x+7}$

$28(x+7) = 24(3x-1)$

$28x + 196 = 72x - 24$

$-28x \quad -28x$

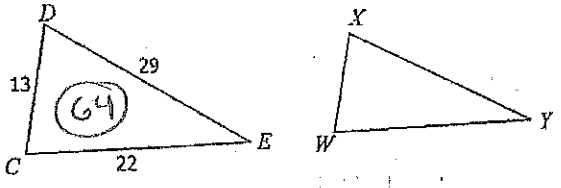
$196 = 44x - 24$

$+24 \quad +24$

$\frac{220}{44} = \frac{44x}{44}$

$x = 5$

9. If $\Delta CDE \sim \Delta WXY$ with a scale factor of 4:3, find the perimeter of ΔWXY.



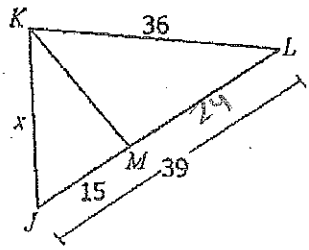
$\frac{4}{3} = \frac{64}{x}$

$\frac{4x}{4} = \frac{192}{4}$

$x = 48$

For problems #10 and #11: $\overline{KM}$ represents an angle bisector.

10.



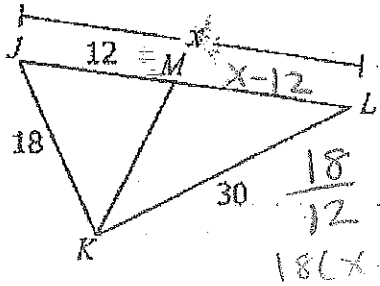
$\frac{x}{15} = \frac{36}{24}$

$24x = 15(36)$

$\frac{24x}{24} = \frac{540}{24}$

$x = 22.5$

11.



$\frac{18}{12} = \frac{30}{x-12}$

$18(x-12) = 12(30)$

$18x - 216 = 360$

$18x = 576$

$x = 32$

Relationships in Triangles

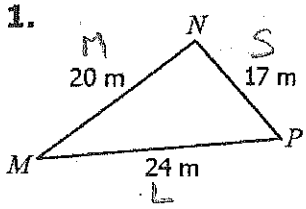
Ordering Side Lengths and Angles from Least to Greatest:

* The smallest side is opposite the smallest angle.
* The medium side is opposite the medium angle.
* The large side is opposite the large angle.

*The smallest angle is opposite the smallest side.
* The medium angle is opposite the medium side.
* The largest angle is opposite the largest side.

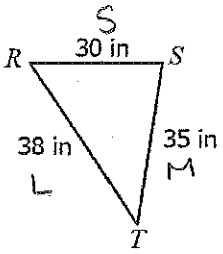
Set 1: Order the angles from least to greatest:

1.



∠M, ∠P, ∠N

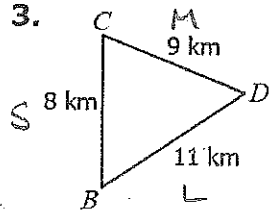
2.



∠T, ∠R, ∠S

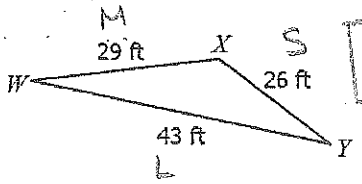
Set 2: Order the angles from greatest to least:

3.



∠C, ∠B, ∠D

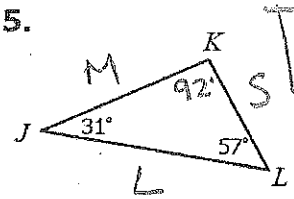
4.



∠X, ∠Y, ∠W

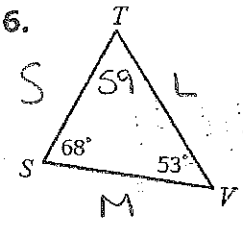
Set 3: Order the sides from least to greatest:

5.



$\overline{KL}, \overline{JK}, \overline{JL}$

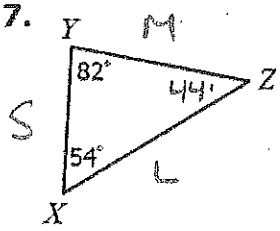
6.



$\overline{ST}, \overline{SV}, \overline{TV}$

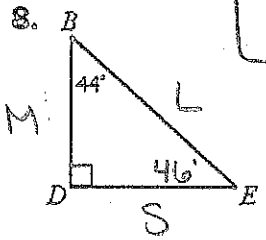
Set 4: Order the sides from greatest to least:

7.



$\overline{ZX}, \overline{YZ}, \overline{YX}$

8.



$\overline{BE}, \overline{BD}, \overline{DE}$

9. **Triangle Inequality Theorem: the sum of the two shorter sides must be greater than the third side!**

Circle all the following triplets that could represent the side lengths of a triangle.

, 25, 43
SKIP

33, 14, 10
10 + 14 > 33
24 > 33
NO

45, 72, 27
27 + 45 > 72
72 > 72
NO

12, 15, 9
9 + 12 > 15
21 > 15
Yes

27, 13, 10
10 + 13 > 27
23 > 27
NO

10.

List the sides of ΔFGH in order from least to greatest if $m\angle F = 5x + 6$, $m\angle G = 12x - 4$, and $m\angle H = 4x + 31$.

* all angles in a triangle add up to 180°

$\angle F + \angle G + \angle H = 180$

$5x+6 + 12x-4 + 4x+31 = 180$

$21x + 33 = 180$

$-33 \quad -33$

$\frac{21x}{21} = \frac{147}{21}$

$x = 7$

$\angle F = 5(7) + 6$

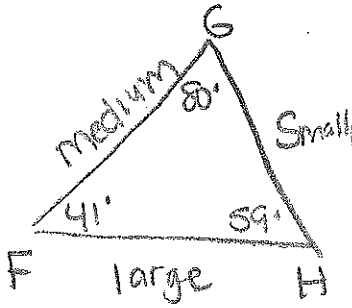
41

$\angle G = 12(7) - 4$

80

$\angle H = 4(7) + 31$

59

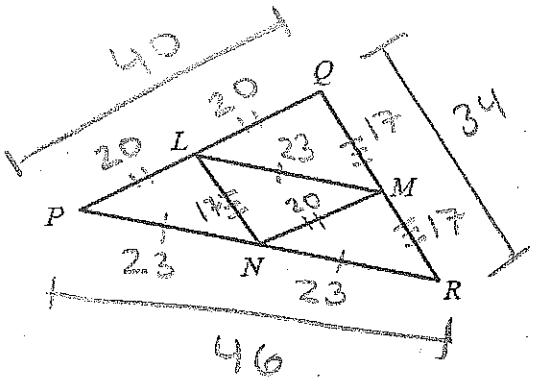


$\overline{GH}, \overline{FG}, \overline{FH}$

small medium large

Answer

11. If L, M, and N are the midpoints of the sides of ΔPQR, $PR = 46$, $PQ = 40$, and $LN = 17$, find each measure.



a) $LM =$ 23

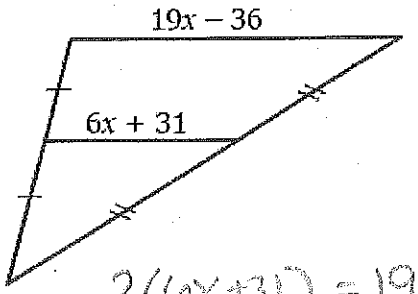
b) $MN =$ 20

c) $QR =$ 34

d) $MR =$ 17

12. Find the value of x. 2(midsegment) = base

(a)



$2(6x+31) = 19x-36$

$12x+62 = 19x-36$

$-12x \quad -12x$

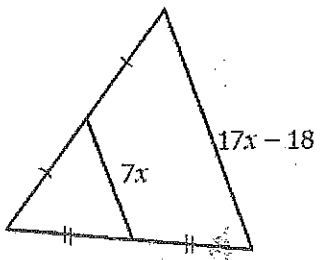
$62 = 7x-36$

$+36 \quad +36$

$98 = 7x$

$x = 14$

(b)



$2(7x) = 17x-18$

$14x = 17x-18$

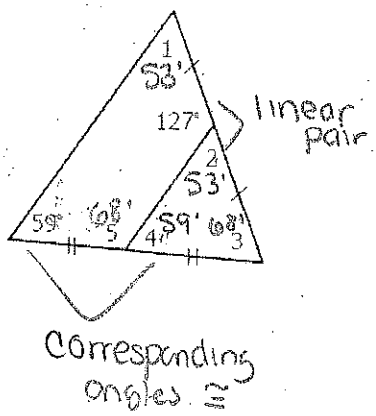
$-17x \quad -17x$

$-3x = -18$

$\frac{-3x}{-3} = \frac{-18}{-3}$

$x = 6$

13. Find the measure of each missing angle.



$m\angle 1 =$ 53°

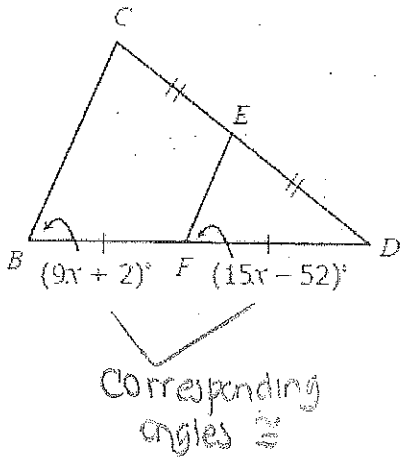
$m\angle 2 =$ 53°

$m\angle 3 =$ 68°

$m\angle 4 =$ 59°

$m\angle 5 =$ 68°

14. Find $m\angle CBF$.



$9x+2 = 15x-52$

$-9x \quad -9x$

$2 = 6x-52$

$+52 \quad +52$

$\frac{54}{6} = \frac{6x}{6}$

$9 = x$

$\angle CBF = 9x+2$

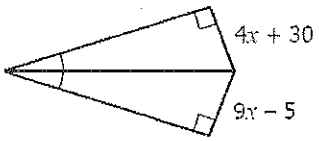
$9(9)+2$

$81+2$

83°

15. The following are angle bisector problems.

(a) Find the value of x.

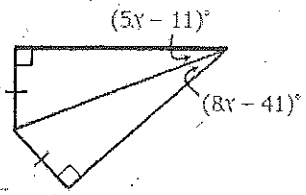


$4x+30 = 9x-5$

$35 = 5x$

$7 = x$

(b) Find the value of x.



$5x-11 = 8x-41$

$+41 \quad +41$

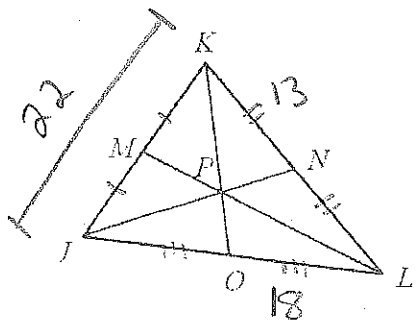
$5x+30 = 8x$

$-5x \quad -5x$

$\frac{30}{3} = \frac{3x}{3}$

$10 = x$

16. If P is the centroid of ΔJKL, $JK = 22$, $KN = 13$, and $OL = 18$, find each missing measure.



a) $KM =$ 11

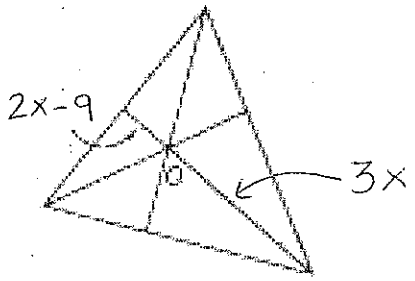
b) $NL =$ 13

c) $KL =$ 26

d) $JO =$ 18

e) $JL =$ 36

17. In the following triangle, O is the centroid. Find the value of x.



$2(2x-9) = 3x$

$4x - 18 = 3x$

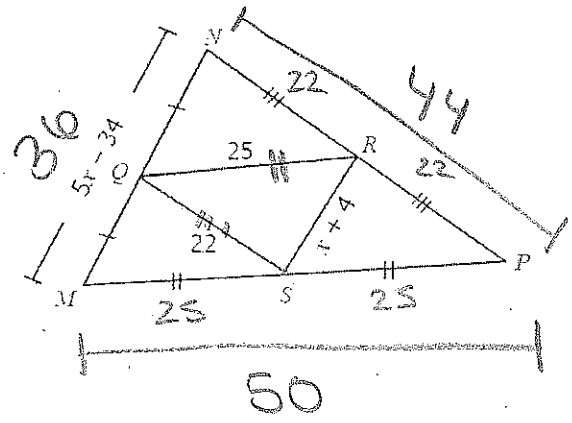
$-4x \quad -4x$

$-18 = -1x$

$\frac{-18}{-1} = \frac{-1x}{-1}$

$18 = x$

18. Find the perimeter of ΔMNP.



$2(x+4) = 5x-34$

$2x+8 = 5x-34$

$-2x \quad -2x$

$8 = 3x - 34$

$+34 \quad +34$

$\frac{42}{3} = \frac{3x}{3}$

$14 = x$

$5(14)-34$

$70-34$

36

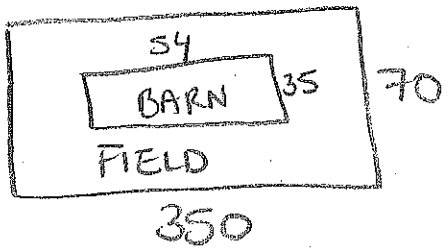
$P = 36+44+50$

130

Answer

Perimeter & Area

1. A field is 70 meters by 350 meters. A barn 35 meters by 54 meters is built in the field. How much area is left over?



Field Area − Barn Area = Left over area

$(350)(70) - (54)(35) = ?$

$24500 - 1890 = \boxed{22{,}610 \text{ m}^2}$

2. If the area of a circle is 49π in^2, then the circumference of the circle is _____.

$\text{Area} = \pi r^2$

$\frac{49\pi}{\pi} = \frac{\pi r^2}{\pi}$

$49 = r^2$

$\sqrt{49} = \sqrt{r^2}$

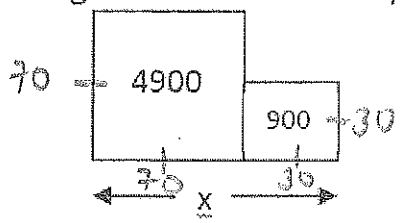
$r = 7$

$C = 2\pi r$

$= 2(3.14)(7)$

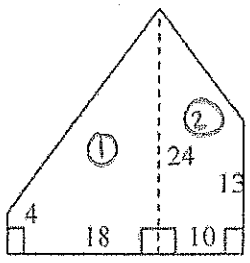
$= \boxed{43.96 \text{ in}}$

3. The figure below is made up of two squares with the areas shown. What is the length of x?



$\boxed{X = 100 \text{ units}}$

4. Find the area of the region shown by dividing it into two trapezoids.



$\frac{1}{2}h(b_1+b_2)$ = area of trapezoid

Trapezoid 1 + Trapezoid 2 = total area

$\left[\frac{1}{2}(18)(4+24)\right] + \left[\frac{1}{2}(10)(24+13)\right] = ?$

$[9(28)] + [5(37)] = ?$

$252 + 185 = \boxed{437 \text{ units}^2}$