Geometry: *Hutschenreuter*
Semester II
Review A

Name KEY (Mrs. H)

Period _____ Date _____

Chapter 6

1.1 Give the simplified ratio of… $\frac{5\ yards}{20\ feet}$. (3 feet) $= \frac{15\ ft}{20\ ft} \div 5 = \frac{3}{4}$

1.1 3:4

In 2 - 3, solve the proportion.

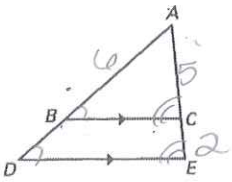
2.2 $\frac{2x}{5} = \frac{x+2}{3}$ $5(x+2) = 3(2x) \rightarrow 5x+10 = 6x$, $-5x$, $10 = x$

2.2 $x = 10$

3.1 $\frac{12}{z} = \frac{z}{3}$ $z^2 = 36 \rightarrow z = \pm\sqrt{36} = \pm 6$

3.1 $z = \pm 6$

4.1 a) Write a similarity statement.
b) State the reason for the similarity.



4.1 a) $\triangle ABC \sim \triangle ADE$

b) AA sim.

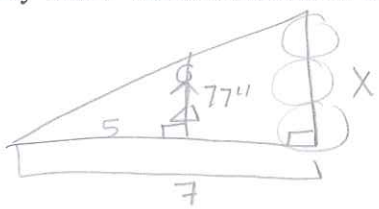
5.1 If AB=6, AC=5, and CE=2, find BD AND the perimeter of ~~the triangle~~ $\triangle ADE$ if DE = 10.

$\frac{6}{BD} = \frac{5}{2}$ $5(BD) = 12$ $BD = 12/5 = 2.4$

5.1 BD = 2.4

Perimeter = 25.4

6.3 Mrs. H and her son like to build snowmen. On a sunny day outside Mrs. H's shadow was 5 paces long. The snowman that her and her son built was 7 paces long. Mrs. H is 6 ft. 5in. tall. How tall is the snowman they built? Draw a sketch of the situation.

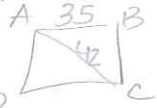


$\frac{77}{5} = \frac{X}{7}$ $\frac{5x}{5} = \frac{539}{5}$ $X = 107.8" \rightarrow 8'\ 11.8"$

6.3 107.8"
OR 8'11.8"

7.2 ABCD~EFGH. $AC = 42\ mm$, AB = 35 mm, and $GE = 70\ mm$.

a) Give the scale factor of their similarity.

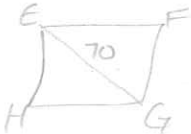


$42/10 \div 7 = 6/10 = 3/5$

7a.1 3/5

b) Write a statement of proportionality.

7b.1 $\frac{AB}{EF} = \frac{BC}{FG} = \frac{CD}{GH} = \frac{DA}{HE}$



In 8 – 10, use the diagram with $VUTS \sim WZYX$.

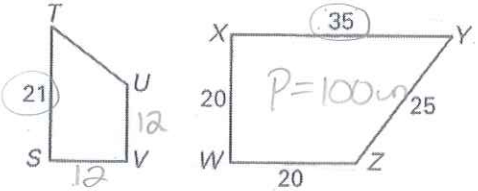
8.1 Find the scale factor of $WZYX$ to $VUTS$. $\frac{35}{21} \div 7 = \frac{5}{3}$

8.1 5/3

9.1 Find the length of $\overline{UV}$. $\frac{5}{3} = \frac{20}{UV}$ $5(UV) = 60$, $\frac{5}{5}$

9.1 UV = 12 un

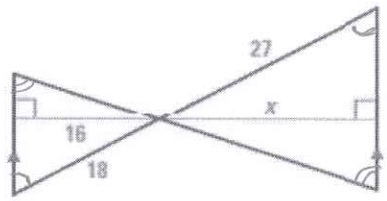
10.2 Find the perimeter of $VUTS$. $\frac{W}{V} = \frac{5}{3} = \frac{100}{P}$ $5P = 300$, $\frac{5}{5}$ $P = 60$



10.2 60 un

In 11 the triangles are similar. Find the value of the missing variable AND identify the segment within the triangle. (segment types: perpendicular bisector, angle bisector, median, altitude)

11.3



$\frac{18}{27} = \frac{16}{x}$

$\frac{18x = 432}{18}$

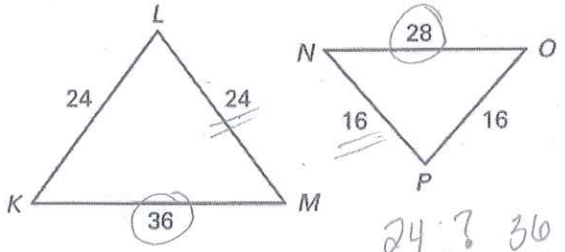
$x = 24$

11.3 x = 24

segment type: Altitude

In 12 – 13, a) Determine whether or not the triangles are similar.
b) Give the reason(s) for your determination.

12.2

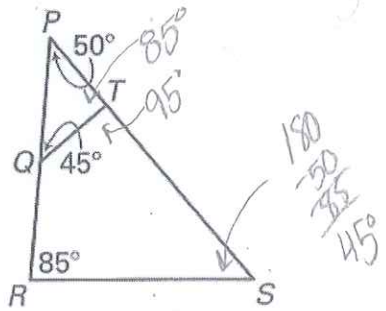


$\frac{24}{16} \stackrel{?}{=} \frac{36}{28} \rightarrow \frac{3}{2} \neq \frac{9}{7}$

12a.1 No

12b.1 Sides not proportional

13.2



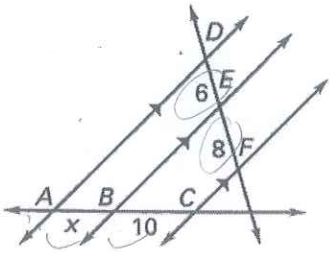
85° 95° 180 − 50 − 85 = 45°

13a.1 Yes

13b.1 AA ~

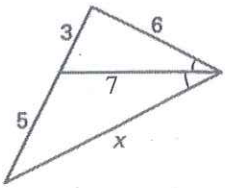
In 14 – 16, find the requested length.

14.2



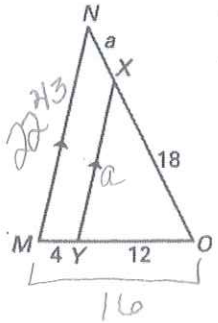
$\frac{x}{10} = \frac{6}{8}$ $8x = 60$ $\frac{}{8}$

15.2



$\frac{6}{3} = \frac{x}{5}$ $3x = 30$ $\frac{}{3}$ $x = 10$

16.2 Given $MN = 22\frac{2}{3}$



$\frac{12}{a} = \frac{16}{22\frac{2}{3}}$ $16a = 272$ $\frac{}{16}$ $a = 17$

14.2 AB= 7.5 un

15.2 x = 10 un

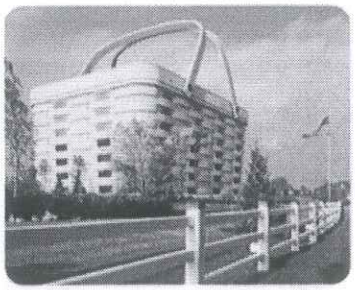
16.2 YX = 17 un

17.2 A basket manufacturer has headquarters in an office building that has the same shape as a basket they sell. The building has a length of 192 feet and a width of 128 feet. The scale factor of the building to the actual basket is 12.8':1".

What are the dimensions of the basket?

L=192

128=W



Longaberger Company Home Office
Newark, Ohio

Length

$\frac{12.8'}{1''} = \frac{192'}{L''}$

$\frac{1(192)}{12.8} = 15$

Width

$\frac{12.8'}{1''} = \frac{128'}{W''}$

$\frac{1(128)}{12.8} = 10$

Length: 15"

Width: 10"

Sections 7.1 – 7.4

In 18 – 19, find the unknown side length (x) of the right triangle.

18.2 Legs: x miles, 37 miles
Hypotenuse: 107 miles

$x^2 + 37^2 = 107^2$

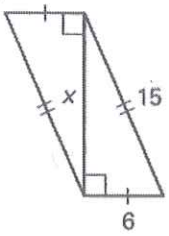
-37^2

$x^2 = 10{,}080$

$x = \sqrt{10{,}080}$

$x = 100.4$

19.2



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

-6^2

$x^2 = 189$

$x = \sqrt{189} \approx 13.75$

20.2 Determine whether the segment lengths 18, 82, and 80 inches form an acute, obtuse, or right triangle.

$18^2 + 80^2$ [?] 82^2

$324 + 6400$ 6724

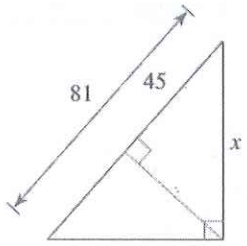
$6724 = 6724$

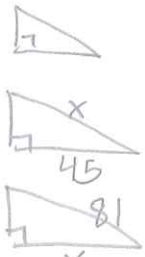
$\therefore$ Rt. $\triangle$

* if $c^2 <$ acute

* if $c^2 >$ obtuse

21.2 Find the value of the variable.





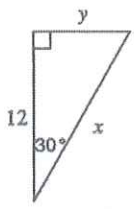
$\frac{x}{81} = \frac{45}{x}$

$x^2 = 3645$

$x = \sqrt{3645} \approx 60.37$

In 22 – 24, find the value of the variable.

22.2



$\frac{\cos 30°}{1} = \frac{12}{x}$

$x = \frac{1(12)}{\cos 30°} \approx 13.86$

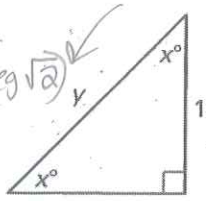
$\frac{\tan 30}{1} = \frac{y}{12}$

$y = 12(\tan 30°)$

$y \approx 6.93$

23.2 45-45-90 $\triangle$

(leg $\sqrt{2}$)



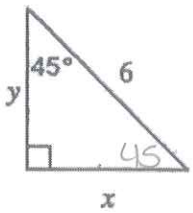
$x = 45°$

$12^2 + 12^2 = y^2$

$288 = y^2$

$y = \sqrt{288} \approx 16.97$

24.



$x = y$

hyp = leg $\sqrt{2}$

$\frac{6}{\sqrt{2}} = \frac{\text{leg}\sqrt{2}}{\sqrt{2}}$

leg ≈ 4.24

$x = y = 4.24$

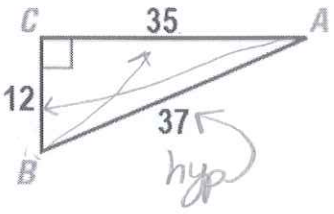
Sections 7.5 – 7.7

In 25, give the proper trigonometric ratio as a fraction.

a.1 $\sin B =$ opp/hyp $= 35/37$

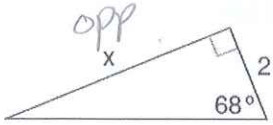
b.1 $\cos B =$ adj/hyp $= 12/37$

c.1 $\tan A =$ opp/adj $= \frac{12}{35}$



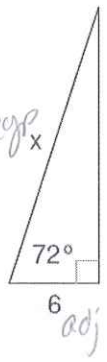
In 26 – 29, find the value of the variable.

26.2



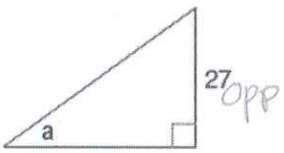
$\frac{\tan 68°}{1} = \frac{x}{21}$ $\quad x = 21(\tan 68)$ $\quad x \approx 51.98$

27.2



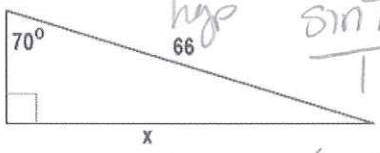
$\frac{\cos 72°}{1} = \frac{6}{x}$ $\quad \frac{1(6)}{\cos 72} = x \approx 19.42$

28.2



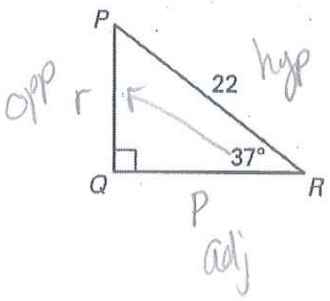
$\tan(a) = \frac{27}{38}$ $\quad a = \tan^{-1}(27/38) = 35.39°$

29.2



$\frac{\sin 70°}{1} = \frac{x}{66}$ $\quad 66(\sin 70) \approx 62.02$

30.5 Solve the right triangle.



$180 - 90 - 37 = 53$

$\sin 37 = \frac{r}{22}$ $\quad r = 22(\sin 37)$ $\quad r = 13.24$

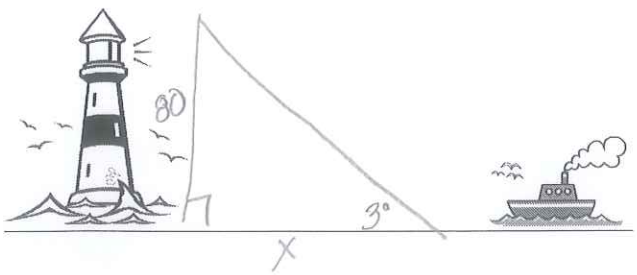
$\cos 37 = \frac{p}{22}$ $\quad p = 22(\cos 37)$ $\quad p = 17.57$

$m\angle P =$ 53°

$p =$ 17.57

$r =$ 13.24

31.4 The angle of elevation from a ship to the top of an 80-foot tall lighthouse is 3°. How far is the ship is from the base of the lighthouse?

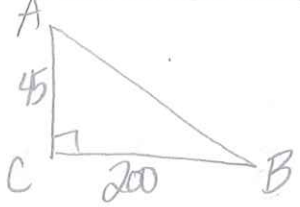


$\frac{\tan 3°}{1} = \frac{80}{x}$

$x = \frac{1(80)}{\tan 3°} \approx 1526.49$ ft

Sections 7.7 – 7.8

32.3 Solve the right triangle with leg lengths of 200 cm and 45 cm.



$c^2 = 45^2 + 200^2$

$c^2 = 42025$

$c = \sqrt{42,025} = 205$

$\tan A = \frac{200}{45}$ $\quad A = \tan^{-1}(\frac{200}{45})$ $\quad m\angle A \approx 77.32°$

$\tan B = \frac{45}{200}$ $\quad \tan^{-1}(45/200)$ $\quad m\angle B \approx 12.68°$

Chapter 8

33. 2-1 Sketch a convex heptagon.

$n = 7$

34. 2 Give the sum of the interior angles of a undecagon (11-gon).

$(n-2)180$

$(11-2)180$

$(9)(180) = 1620°$

35. 2 Find an exterior angle measure of a regular Pentagon. $\rightarrow n = 5$

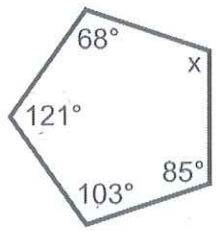
$\frac{360}{n} = \frac{360}{5} = 72°$

36. 2 Each exterior angle of a regular polygon is 36 degrees. Name the type of polygon.

$\frac{360}{n} = \frac{36°}{1}$ $\quad \frac{1(360)}{36} = n$

Decagon $\quad n = 10$

37. 2-1 Find the value of x AND find the measure of the smallest interior angle.



$n = 5$

$(5-2)180 = 540$

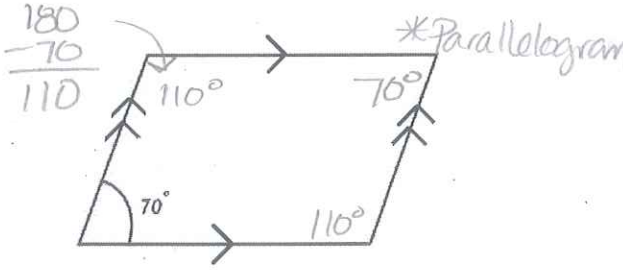
$X + 68 + 121 + 103 + 85 = 540$

$X + 377 = 540$

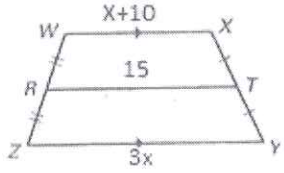
$X = 163$

Small $\angle = 68°$

38. 2-2 Find the measure of missing angles.



39. 2-5 Find x.



Midsegment $= \frac{1}{2}(b_1 + b_2)$

$2\left(15 = \frac{1}{2}(x + 10 + 3x)\right)2$

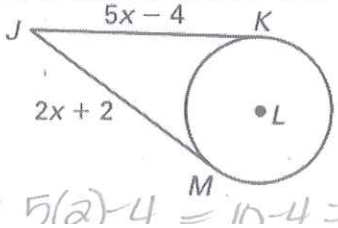
$30 = 4x + 10$

$20 = 4x$

$X = 5$

Sections 10.1-10.2, 11.4-11.5

40. 2-1 In $\odot L$, K and M are points of tangency. Find the length of $\overline{JK}$.



$5x - 4 = 2x + 2$

$-2x \quad +4$

$3x = 6 \quad X = 2$

$JK = 5(2) - 4 = 10 - 4 = 6$

47. 2 Coin

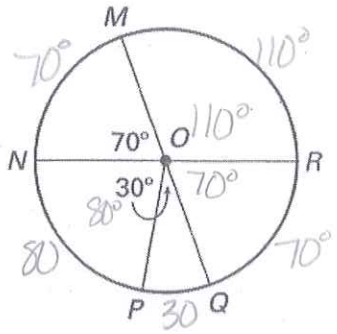
* central ∠'s = arc measure

In 41 - 43, give the type of arc named in the figure (*major arc, minor arc, or semicircle*) AND give the measure of the named arc.

41.$_{2\text{-}2}$ $m\widehat{RQ}$ type: Minor measure: 70°

42.$_{2\text{-}2}$ $m\widehat{MPR}$ type: Major measure: 250°

43.$_{2\text{-}2}$ $m\widehat{RN}$ type: Semicircle measure: 180°



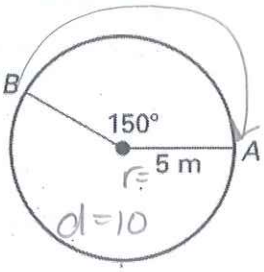
360 − 110 = 250

44.$_{2\text{-}4}$ Find the length of $\widehat{BA}$. 44.$_2$ 13.09 m

arc Length = $\frac{\theta}{360} \cdot (\text{circumf.})$

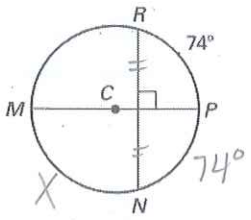
$S = \frac{\theta}{360} \cdot d\pi$

$S = \frac{150}{360} \cdot 10\pi \approx 13.0899$



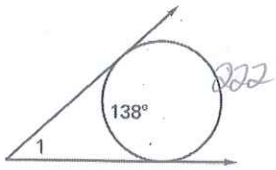
Sections 10.3 – 10.5

45.$_{2\text{-}3}$ Find $m\widehat{NM}$. 45.$_2$ 106°



180 − 74 = 106

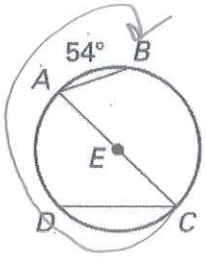
46.$_{2\text{-}5}$ Find $m\angle 1$. 46.$_2$ 42°



360 − 138 = 222

$m\angle 1 = \frac{222 - 138}{2} = \frac{84}{2} = 42$

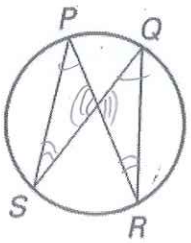
47.$_{2\text{-}4}$ Find $m\angle\widehat{CAB}$. 47.$_2$ 234°



180 − 54 = 126 = $m\widehat{BC}$

360 − 126 = 234

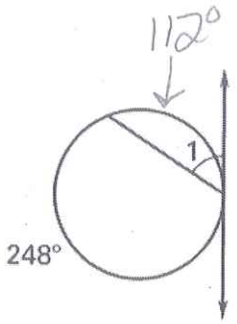
48.$_{2\text{-}4}$ Mark and list the pairs of congruent angles. 48.$_2$



$m\angle P \cong m\angle Q$

$m\angle S \cong m\angle R$

49.2-5 Find $m\angle 1$.



360
248
112

$\frac{112}{2} = 56$

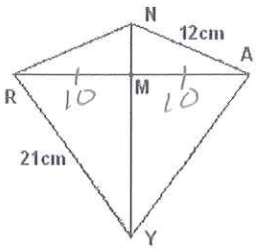
49.2 56°

Sections 11.1 – 11.3, 11.6

50. Describe the characteristics of a kite.

→ 2 pairs of consecutive ≅ sides

→ Diagonals ⊥ → one diagonal bisected

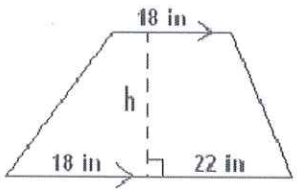


51.3-2 Find the area of kite RYAN (to the right), if RM = 10 cm and NY = 26 cm.

$\text{Area} = \frac{1}{2}(d_1)(d_2)$

$A = \frac{1}{2}(20)(26) = 260\ cm^2$

52.3-2 Find the value for h, if the area is 580 in^2.



$A(\text{trap}) = \frac{1}{2}(h)(b_1 + b_2)$

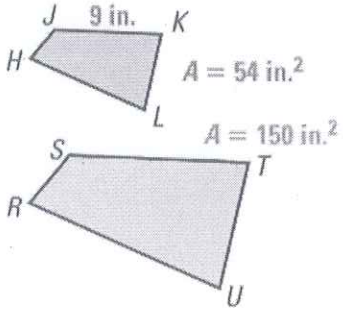
$580 = \frac{1}{2}(h)(18+18+22)$

$580 = \frac{1}{2}(h)(58)$

$\frac{580}{29} = \frac{h(29)}{29}$

$h = 20$ in

53.3-3 HJKL ~ RSTU. Find the length of ST.



$\text{Area}_{\text{ratio}} = \frac{54}{150}$

$\text{Length}_{\text{ratio}} = \frac{\sqrt{54}}{\sqrt{150}}$

$\frac{\sqrt{54}}{\sqrt{150}} = \frac{9}{ST}$

$\frac{9(\sqrt{150})}{\sqrt{54}} = ST$

$ST = 15$ in

54. 3-3 In pottery class you made three rectangular serving trays with a side ratio of 2:5:7. The side length of the largest tray is 30 inches and has an area of 600 square inches. Find the area of the smallest tray.

Small $\overset{x}{\boxed{A=?}}$

Med $\boxed{}$

Large $\overset{30}{\boxed{A=600}}$

$\frac{2}{7} = \frac{x}{30}$

$7x = 60$

$x = 8.57$ in

Side

$\text{Area}_{\text{ratio}} = \frac{2^2}{7^2} = \frac{4}{49}$

$\frac{4}{49} = \frac{A}{600}$

$\frac{49A}{49} = \frac{2400}{49}$

$A \approx 48.98\ in^2$