Geometry

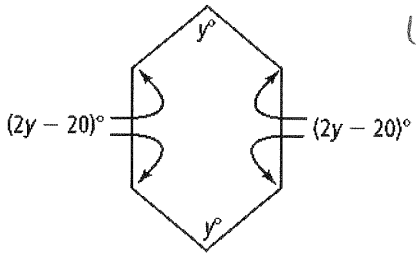
Final Exam STUDY GUIDE

Name: _____

The exam is worth 20% of your final grade. On the exam, you will be permitted to use one 3" by 5" note card with your notes on it. The notes on the notecard must be hand written by you in your own handwriting.

On the exam, show your work whenever possible and circle your answer as appropriate.

1. Find the value of y.



$(n-2)180$

$(6-2)180 = 720°$

$y + y + 2(2y-20) + 2(2y-20) = 720$

$2y + 4y - 40 + 4y - 40 = 720$

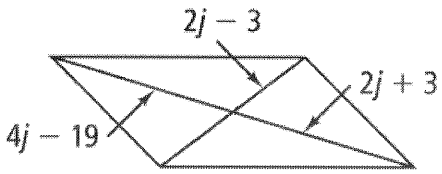
$10y - 80 = 720$

$10y = 800$

$\boxed{y = 80}$

2. Find the value of the variable in each parallelogram.

a)

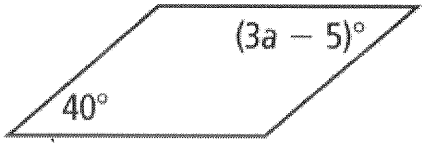


$4j - 19 = 2j + 3$

$2j = 22$

$\boxed{j = 11}$

b)



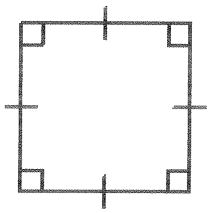
$3a - 5 = 40$

$3a = 45$

$\boxed{a = 15}$

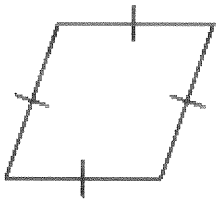
3. Determine whether the parallelogram is a rectangle, rhombus, or square.

a)



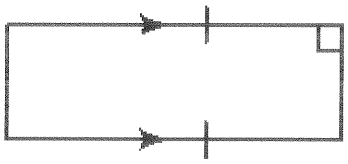
Square

b)



rhombus

c)



rectangle

4. Find the value of the missing angles of the kite.

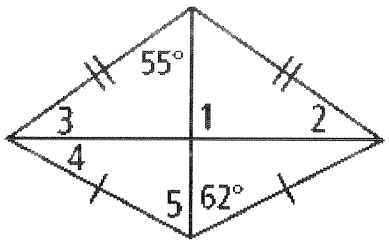
$\angle 1 = 90°$

$\angle 2 = 35°$

$\angle 3 = 35°$

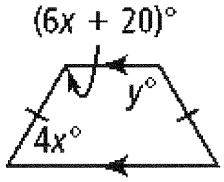
$\angle 4 = 28°$

$\angle 5 = 62°$



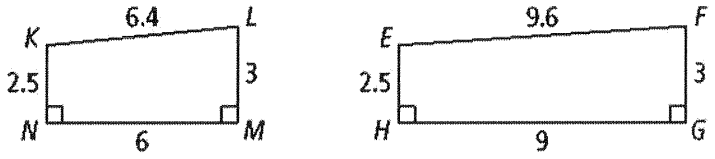
5. Find the value of the missing variables of the isosceles trapezoid.

$6x+20+4x=180$
$10x+20=180$
$10x=160$
$x=16^\circ$
$y=116^\circ$



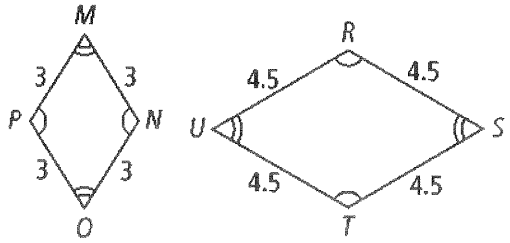
6. Determine whether the polygons are similar. If so, write a similarity statement and give the scale factor.

a)



NO

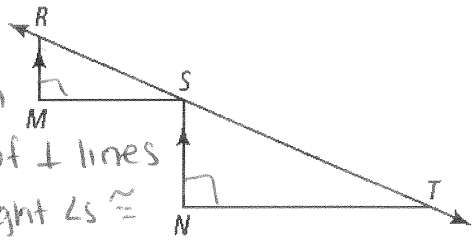
b)



yes; $\triangle PMN \sim \triangle URST$; $\frac{2}{3}$

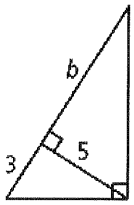
7. Given: RM || SN; RM ⊥ MS; SN ⊥ NT
Prove: $\Delta RSM \sim \Delta STN$

1) RM ∥ SN; RM ⊥ MS; SN ⊥ NT	1) Given
2) ∠RMS and ∠SNT are right angles	2) Def of ⊥ lines
3) ∠RMS ≅ ∠SNT	3) all right ∠s ≅
4) ∠MRS ≅ ∠NST	4) corresponding angle thm.
5) $\triangle RSM \sim \triangle STN$	5) AA ~ Theorem



8. Solve for each variable.

a) (Right Δ Similarity)

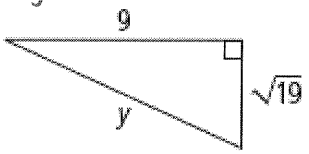


$\frac{3}{5} = \frac{5}{b}$

$3b = 25$

$\boxed{b = 25/3}$

b) Pythag. Thm.

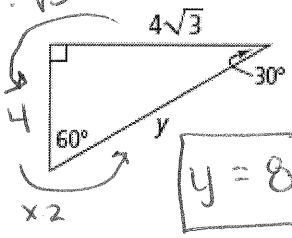


$9^2 + \sqrt{19}^2 = y^2$

$81 + 19 = y^2$

$\boxed{y = 10}$

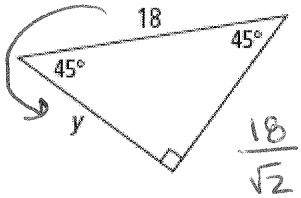
c) ÷√3



Special Right Δ

$\boxed{y = 8}$

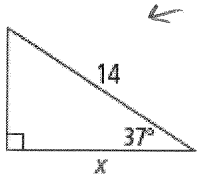
d) ÷√2



Special Right Δ

$\frac{18}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{18\sqrt{2}}{2} = \boxed{9\sqrt{2}}$

e)

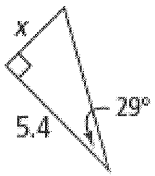


SOH CAH TOA

$\cos 37 = \frac{x}{14}$

$\boxed{x = 11.18}$

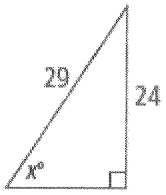
f)



$\tan 29 = \frac{x}{5.4}$

$\boxed{x = 2.99}$

g)

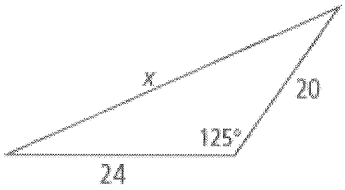


$\sin x = \frac{24}{29}$

$x = \sin^{-1}(24/29)$

$\boxed{x = 55.9°}$

h) Law of cosines

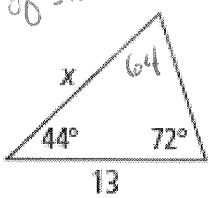


$x^2 = 20^2 + 24^2 - 2(20)(24)\cos 125$

$x^2 = 1526.63$

$\boxed{x = 39.1}$

i) Law of sines



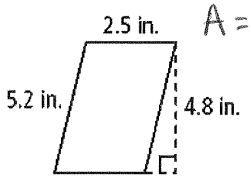
$\frac{\sin 64}{13} = \frac{\sin 72}{x}$

$x \sin 64 = 13 \sin 72$

$\boxed{x = 13.8}$

9. Find the area of each figure below. Round to the nearest tenth if needed.

a)

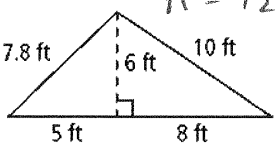


$A = b \cdot h$

$A = (2.5)(4.8)$

$= 12 \text{ in}^2$

b)



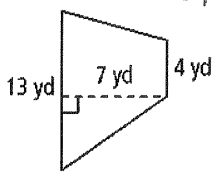
$A = \frac{1}{2}bh$

$A = \frac{1}{2}(6)(13)$

$= 39 \text{ ft}^2$

c)

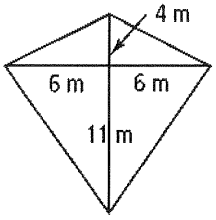
$A = \frac{1}{2}h(b_1 + b_2)$



$A = \frac{1}{2}(7)(4+13)$

$= 59.5 \text{ yd}^2$

d)

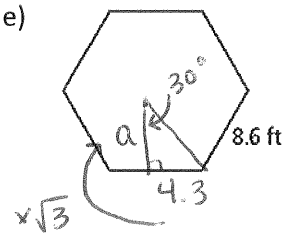


$A = \frac{1}{2}d_1d_2$

$A = \frac{1}{2}(12)(15)$

$= 90 \text{ m}^2$

e)



$A = \frac{1}{2}ap$

$360 \div 12 = 30$

$a = 4.3\sqrt{3}$

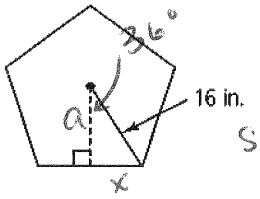
$P = 8.6(6)$

$= 51.6$

$A = \frac{1}{2}(4.3\sqrt{3})(51.6)$

$= 192.2 \text{ ft}^2$

f)



$360 \div 10 = 36$

$\sin 36 = \frac{x}{16}$

$x = 16 \sin 36$

$x = 9.4$

$\cos 36 = \frac{a}{16}$

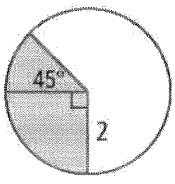
$a = 16 \cos 36$

$a = 12.9$

$A = \frac{1}{2}(12.9)(94)$

$= 606.3 \text{ in}^2$

g)



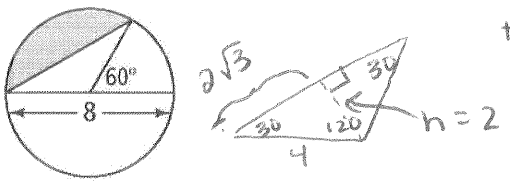
$A = \frac{m\overset{\frown}{AB}}{360} \cdot \pi r^2$

$A = \frac{135}{360} \cdot \pi (2)^2$

$= 4.7 \text{ units}^2$

h)

A = Area of sector − area of triangle

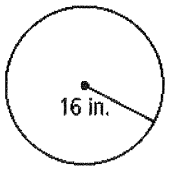


$A = \frac{120}{360} \cdot \pi (4)^2 - \frac{1}{2}(4\sqrt{3})(2)$

$A = 9.8 \text{ units}^2$

10. In part a, find the circumference. In part b, find the arc length.

a)



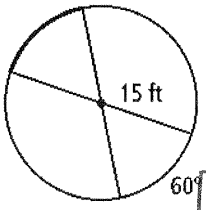
$C = 2\pi r$

$C = 2\pi(16)$

$= 32\pi$ in or 100.5 in

b)

Arc length $= \frac{m\overset{\frown}{AB}}{360} \cdot 2\pi r$

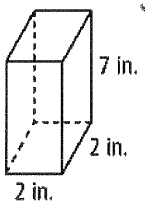


$\frac{60}{360} \cdot 2\pi(15)$

5π or 15.7 ft

11. Find the surface area and volume of the following figures.

a)



$S.A. = ph + 2B$

$S.A. = (8)(7) + 2(4)$

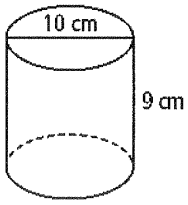
$= 64 \text{ in}^2$

$V = Bh$

$V = (2 \times 2)(7)$

$= 28 \text{ in}^3$

b)



$S.A. = 2\pi rh + 2B$

$= 2\pi(5)(9) + 2(\pi 5^2)$

$= 439.8 \text{ cm}^2$

$V = Bh$

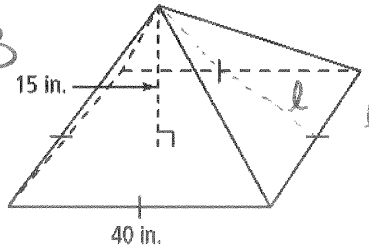
$V = (\pi 5^2)(9)$

$= 706.9 \text{ cm}^3$

c)

$S.A. = \frac{1}{2}pl + B$

$V = \frac{1}{3}Bh$



$l^2 = 15^2 + 20^2$

$l^2 = 625$

$l = 25$

$S.A. = \frac{1}{2}(160)(25) + (40)(40)$

$= 3600 \text{ in}^2$

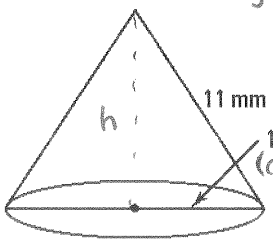
$V = \frac{1}{3}(40 \times 40)(15)$

$= 8000 \text{ in}^3$

d)

$S.A. = \pi rl + B$

$V = \frac{1}{3}Bh$



$h^2 + 5^2 = 11^2$

$h^2 = 96$

$h = 9.8$

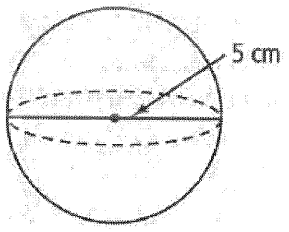
$S.A. = \pi(5)(11) + \pi(5)^2$

$= 251.3 \text{ mm}^2$

$V = \frac{1}{3}(\pi(5)^2)(9.8)$

$= 256.6 \text{ mm}^3$

e)



$S.A. = 4\pi r^2$ $V = \frac{4}{3}\pi r^3$

$S.A. = 4\pi(2.5)^2$

$= 78.5 \text{ cm}^2$

$V = \frac{4}{3}\pi(2.5)^3$

$= 65.4 \text{ cm}^3$