GEOCORE FINAL EXAM REVIEW **KEY**

1) Solve the proportion $\frac{18}{x} = \frac{7}{4}$

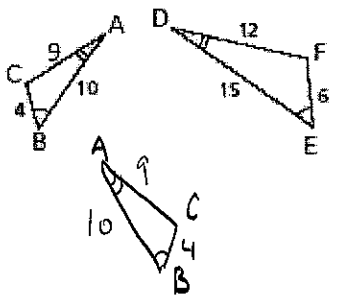
$7x = 18(4)$

$\frac{7x}{7} = \frac{72}{7}$

$x = 10.29$

2) Determine if the triangles are similar, and if so what is the similarity ratio (largest to smallest Δ)?

ΔABC and ΔDEF

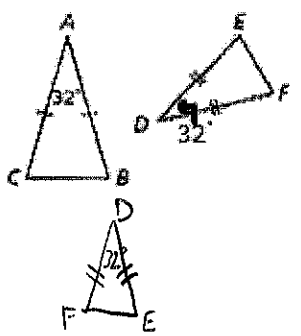


$\frac{\text{Big}}{\text{little}}$: $\frac{12}{9} = \frac{15}{10} = \frac{6}{4}$

$1.33 \neq 1.5 = 1.5$

Does not equal, Not Similar

3) Why are the two triangles similar and what is the correct similarity statement?

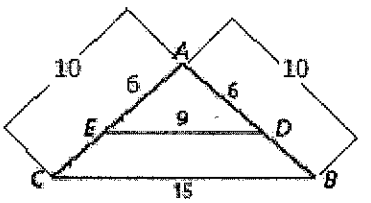


ΔABC ~ ΔDEF because of SAS.

$\frac{CA}{FD} = \frac{BA}{ED}$ $32° = 32°$

$\angle A \cong \angle D$

4) Explain why the triangles are similar and then find AB.



ΔADE ~ ΔABC by SSS.

$\frac{AD}{AB} = \frac{AE}{AC} = \frac{ED}{CB}$

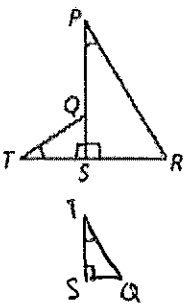
$\frac{6}{10} = \frac{6}{10} = \frac{9}{15}$

$0.6 = 0.6 = 0.6$

$AB = 10$

* On the exam, you will probably need to set up a proportion to solve for AB.

5) Explain why the triangles are similar and write a similarity statement.

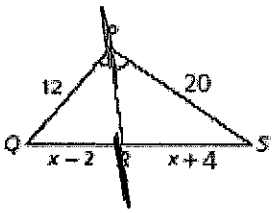


ΔSPR ~ ΔSTQ

by AA.

GEOCORE FINAL EXAM REVIEW KEY

6) Find QR.



$\frac{12}{20} = \frac{x-2}{x+4}$

$20(x-2) = 12(x+4)$

$20x - 40 = 12x + 48$

$-12x \quad -12x$

$8x - 40 = 48$

$+40 \quad +40$

$\frac{8x}{8} = \frac{88}{8}$

$x = 11$

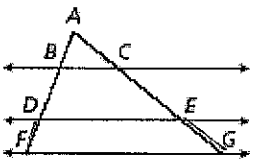
$QR = x - 2$

$QR = 11 - 2 = 9$

7) Fill in the blank.

$\frac{AB}{DF} = \frac{AC}{\ }$

EG



8) The scale of this model of the space shuttle is 1ft : 40 ft. In the actual space shuttle, the main cargo bay measures 20 ft wide by 80 ft long. What is the length of the cargo bay in the model?

model $\frac{1ft}{40ft} = \frac{xft}{80ft}$

actual

$80(1) = x(40)$

$\frac{80}{40} = \frac{40x}{40}$

$x = 2ft$

9) The ratio of the side lengths of a triangle is 4:6:8 and its perimeter is 54 cm. What is the length of the shortest side?

shortest

add all the sides

$4x + 6x + 8x = 54$

$\frac{18x}{18} = \frac{54}{18}$

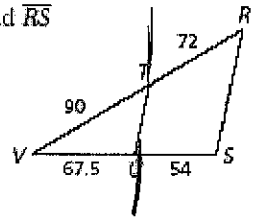
$x = 3$

$4(3) = 12cm$

GEOCORE FINAL EXAM REVIEW **KEY**

10) Write a proportion for the following given segments to be parallel.

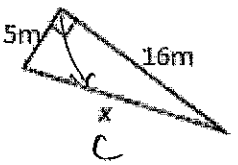
$\overline{TU}$ and $\overline{RS}$



$$\frac{VT}{TR} = \frac{VU}{US}$$

$$\frac{90}{72} = \frac{67.5}{54}$$

11) Use Pythagorean Theorem to find the value of *x*. Round to the nearest hundredth.



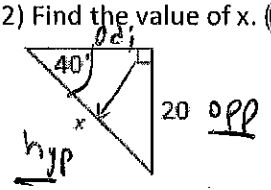
$$5^2 + 16^2 = x^2$$

$$25 + 256 = x^2$$

$$\sqrt{281} = \sqrt{x^2}$$

$$x = 16.76$$

12) Find the value of x. (SOH ~~CAHTOA~~)



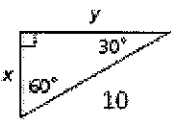
$$(\sin 40°) = \frac{20}{x}$$

$$x \cdot 0.643 = \frac{20}{x} \cdot x$$

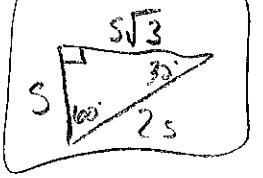
$$\frac{0.643x}{0.643} = \frac{20}{0.643}$$

$$x = 31.10$$

13) Find the value of x and y.



Note and!



$$\frac{2s}{2} = \frac{10}{2}$$

$$s = 5$$

$$s = x$$

$$\boxed{x = 5}$$

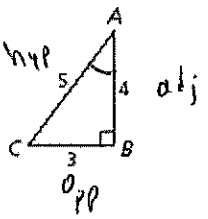
$$y = s\sqrt{3}$$

$$\boxed{y = 5\sqrt{3} \text{ or } 8.66}$$

14) Find cos A. Leave your answer as a fraction.

~~SOH~~ CAH ~~TOA~~

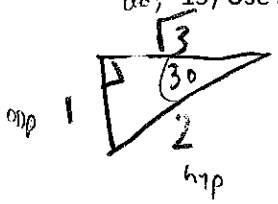
$$C = \frac{a}{h}$$



$$\cos A = \frac{4}{5}$$

GEOCORE FINAL EXAM REVIEW **KEY** Soh Cah Toa

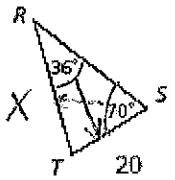
15) Use special right triangles to find the value of tan $30°$. Leave your answer as a ~~simplified fraction~~. round to the nearest hundredth



$\tan = \frac{opp}{adj}$ $\tan 30° = \frac{1}{\sqrt{3}}$

$\frac{1}{\sqrt{3}} = 0.58$

16) Use the Law of Sines to find $\overline{RT}$. Round to the nearest tenth.



$\boxed{\frac{\sin A}{a} = \frac{\sin B}{b}}$ Note card

$\frac{\sin 70}{x} = \frac{\sin 36}{20}$

$\frac{0.940}{x} = \frac{0.588}{20}$

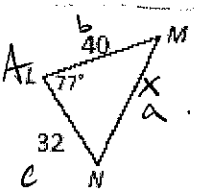
$0.588x = 20(0.940)$

$\frac{0.588x}{0.588} = \frac{18.8}{0.588}$

$x = 31.97$

$x = 32.0$

17) Use the Law of Cosines to find $\overline{MN}$. Round to the nearest tenth.



Note card

$a^2 = b^2 + c^2 - 2bc\cos A$

$x^2 = 40^2 + 32^2 - 2(40)(32)\cos 77°$

$x^2 = 1600 + 1024 - 2560(0.225)$

$x^2 = 2624 - 576$

$\sqrt{x^2} = \sqrt{2048}$

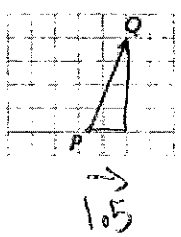
$x = 45.25$

$x = 45.3$

18) Find the sum of the vectors: <4,5> and <5,0>.

$$\begin{array}{r} \langle 4, 5\rangle \\ + \langle 5, 0\rangle \\ \hline \langle 9, 5\rangle \end{array}$$

19) Write the vector $\overrightarrow{PQ}$ in component form.



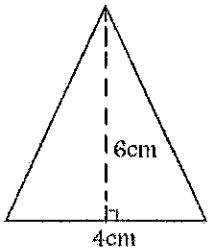
$\langle 1.5, 4\rangle$

20) What are equal vectors?

Vectors that have the same magnitude & travel in the same direction

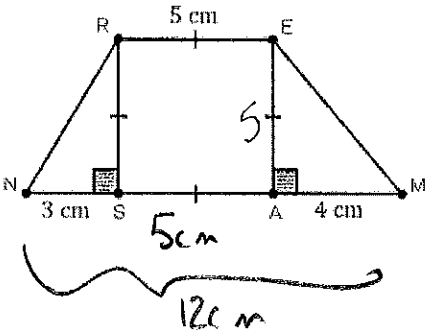
GEOCORE FINAL EXAM REVIEW **KEY** Notecard* Area formulas

21) Finding area of all shapes.



△ : $A = \frac{bh}{2}$

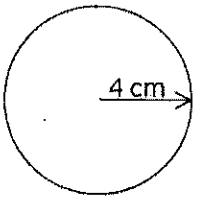
$A = \frac{4(6)}{2} = \frac{24}{2} = 12\,cm^2$



⏢ : $A = \frac{(b_1+b_2)h}{2}$

$\frac{(5+12)5}{2} = \frac{17(5)}{2}$

$A = 42.5\,cm^2$

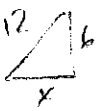


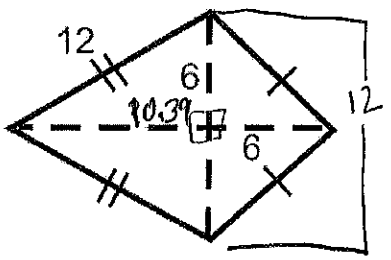
○ : $A = \pi r^2$

$3.14(4)^2$

$3.14(16)$

$A = 50.24\,cm^2$





$A = \frac{d_1 \cdot d_2}{2}$

$x^2 + 6^2 = 12^2$

$x^2 + 36 = 144$

$-36 \quad -36$

$\sqrt{x^2} = \sqrt{108}$

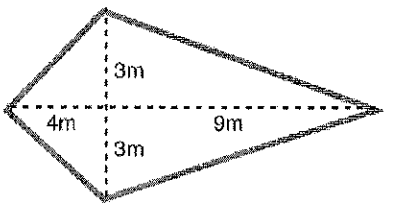
$x = 10.39$

$d_1 = 16.39$

$d_2 = 12$

$A = \frac{16.39(12)}{2}$

$A = 98.34$ units^2

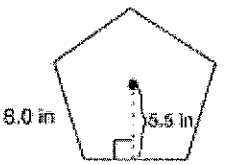


$d_1 = 13m$

$d_2 = 6m$

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

$A = 39\,m^2$



$A = \frac{Pa}{2}$ P = perim. a = apothem

$P = 8+8+8+8+8 = 40$

or

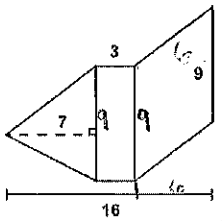
$8(5) = 40$

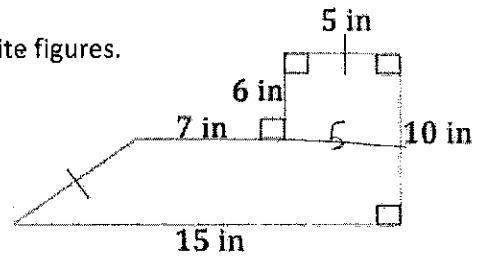
$A = \frac{40(5.5)}{2}$

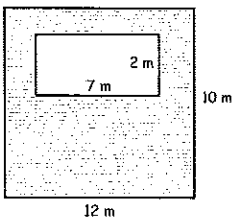
$A = 110\,in^2$

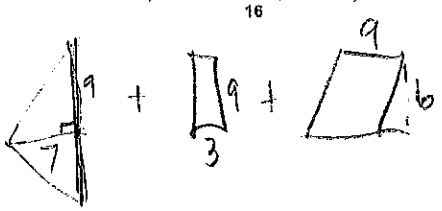
GEOCORE FINAL EXAM REVIEW **KEY**

22) Find the area of composite figures.







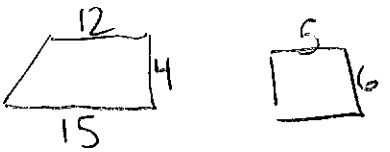


$\frac{bh}{2} + bh + bh$

$\frac{9(7)}{2} + 9(3) + 6(9)$

$31.5 + 27 + 54$

112.5 units^2



$\frac{(b_1+b_2)h}{2} + bh$

$\frac{(12+15)4}{2} + 5(6)$

$54 + 30$

84 in^2

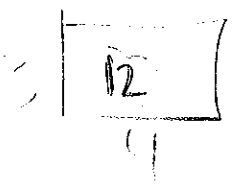
$bh - bh$

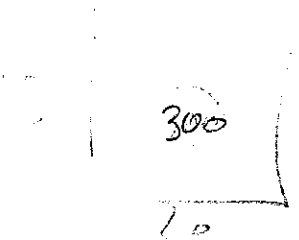
$12(10) - 7(2)$

$120 - 14$

106 m^2

23) One rectangle has a length and width of 3 and 4. Another rectangle has a length and width of 15 and 20. Find the ratio of the **areas** of the rectangles.





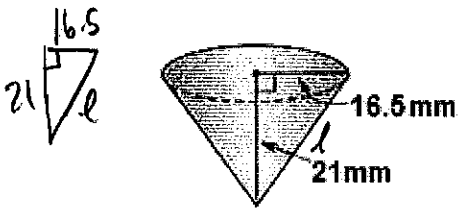
$12 : 300$

$\frac{12}{300} = \boxed{\frac{1}{25}}$

GEOCORE FINAL EXAM REVIEW **KEY**

☆ Notecard [Surface Area Formulas]

24) Find the Surface area and Volume of each of the following.



$SA = \pi r \ell + \pi r^2 = 3.14(16.5)(26.71) + 3.14(16.5)^2$

$138385 + 854.87$

$16.5^2 + 21^2 = \ell^2$

$272.25 + 441 = \ell^2$

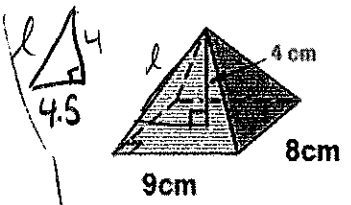
$\sqrt{713.25} = \sqrt{\ell^2}$

$\ell = 26.71$

$SA = 2238.72 mm^2$

Volume: $\frac{\pi r^2 h}{3} = \frac{3.14(16.5)^2(21)}{3}$

$V = 5984.06 mm^3$



$SA = \frac{P\ell}{2} + B = \frac{34(6.02)}{2} + 9(8)$

$4.5^2 + 4^2 = \ell^2$

$20.25 + 16 = \ell^2$

$\sqrt{36.25} = \sqrt{\ell^2}$

$\ell = 6.02$

$P = 9 + 8 + 9 + 8$

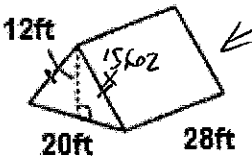
$P = 34$

$SA = 174.34 cm^2$

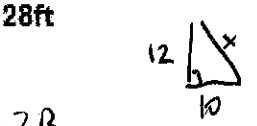
$V = \frac{Bh}{3}$

$\frac{(9.8)(4)}{3}$

$V = 96 cm^3$



Base of Prism is a Δ.



$10^2 + 12^2 = x^2$

$100 + 144 = x^2$

$\sqrt{244} = \sqrt{x^2}$

$x = 15.62$

$SA = Ph + 2B$

$P = 15.62 + 15.62 + 20$

$P = 51.24$

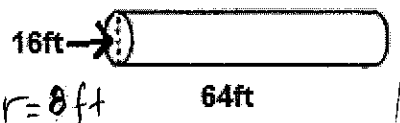
$SA = 51.24(28) + 2\left(\frac{20(12)}{2}\right)$

$1434.72 + 2(120)$

$1434.72 + 240$

$SA = 1674.72 ft^2$

$V = \frac{Bh}{3} = \frac{120(28)}{3} = 1120 ft^3$ volume



$SA = 2\pi rh + 2\pi r^2$

$SA = 2(3.14)(8)(64) + 2(3.14)(8)^2$

$SA = 3215.36 + 401.92$

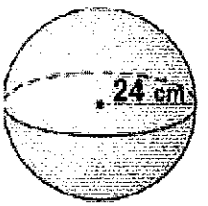
$SA = 3617.28 ft^2$

$V = 3.14 r^2 h$

$3.14(8)^2(64)$

$3.14(64)(64)$

$V = 12{,}861.44 ft^3$



$SA = 4\pi r^2$

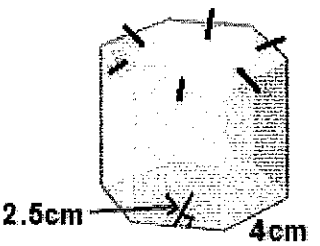
$4(3.14)(24)^2$

$SA = 7234.56 cm^2$

$V = \frac{4\pi r^3}{3}$

$\frac{4(3.14)(24)^3}{3}$

$V = 57{,}876.48 cm^3$



Base of the prism is a reg. hexagon

$SA = Ph + 2B$

$P = 4(6) = 24$ $h = 5$

$B = \frac{Pa}{2} = \frac{24(2.5)}{2} = 30$

$SA = 24(5) + 2(30) = 180 cm^2$

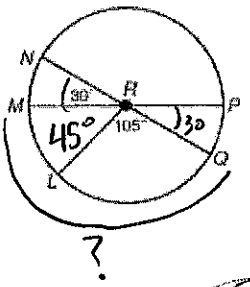
$V = Bh$

$30(5)$

$V = 150 cm^3$

GEOCORE FINAL EXAM REVIEW **KEY**

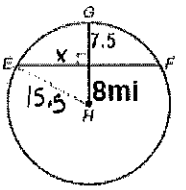
25) Find the measure of arc QM.

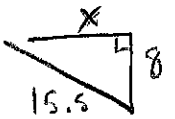


?

$105+45=150°$

26) Find the length of EF.





$8^2+x^2=15.5^2$

$64+x^2=240.25$

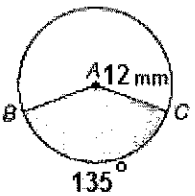
$-64 \quad -64$

$\sqrt{x^2}=\sqrt{176.25}$

$x=13.28 \quad \times 2$

$EF=26.56mi$

27) Find the area of the sector.



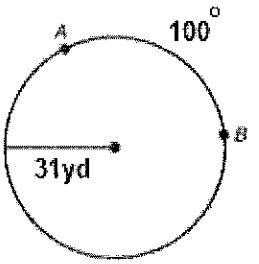
$A=\pi r^2\left(\frac{m}{360}\right)$

$3.14(12)^2\left(\frac{135}{360}\right)$

$3.14(144)(0.375)$

$A=169.56mm^2$

28) Find the arc length.



Arc Length

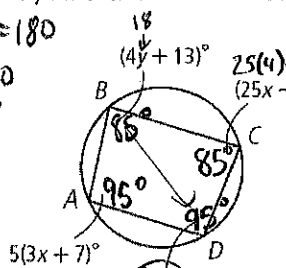
$l=2\pi r\left(\frac{m}{360}\right)$

$l=2(3.14)(31)\left(\frac{100}{360}\right)$

$2(3.14)(31)(0.278)$

$l=54.12yd$

29) Find the measure of each angle.



$4y+13+5y+5=180$

$9y+18=180$

$-18 \quad -18$

$\frac{9y}{9}=\frac{162}{1}$

$y=18$

18

$25(4)-15$

$5(3x+7)$

$5(12+7)$

$5(19)$

$5(y+1)$

$5y+5$

$5(18)+5=95$

opp ∠s are supp

$25x-15+5(3x+7)=180$

$25x-15+15x+35=180$

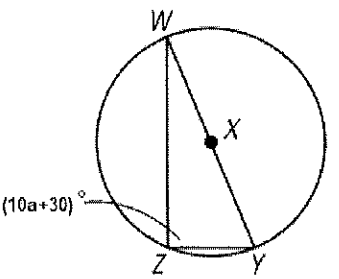
$40x+20=180$

$-20 \quad -20$

$\frac{40x}{40}=\frac{160}{40}$

$x=4$

30) Find a = 6.



$10a+30=90$

$\frac{10a}{10}=\frac{60}{10}$

$a=6$

31) Find the measure of angle PRU = 62° and the measure of arc PS = 62°.

$\frac{124}{2}=62$

$31\times2=62$