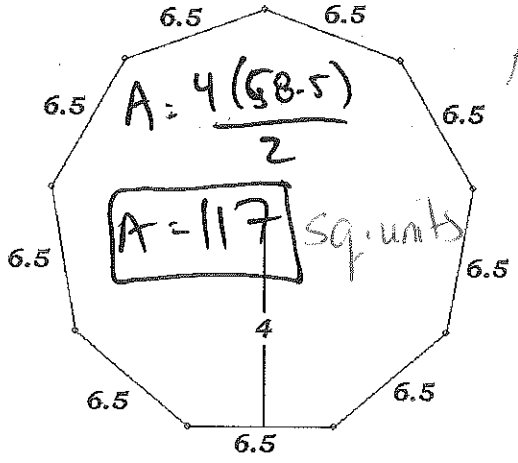
Stolt-Key

REVIEW for Geometry in Construction Test 2

: Solids

Find the (combined) area **AND** perimeter of each of the regular polygonal shapes below.

1.



$A = \frac{4(6.5)}{2}$

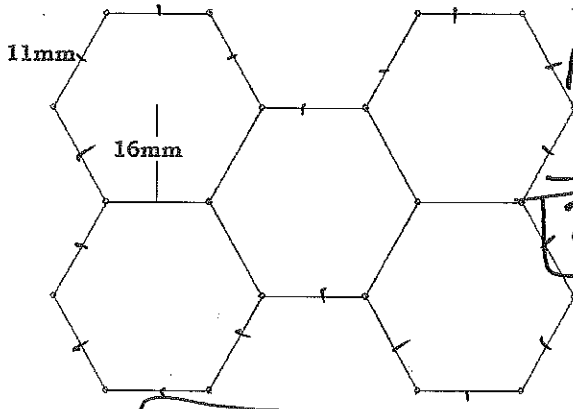
$A = 117$ sq. units

$A = \frac{a \cdot p}{2}$

$P = 6.5(9)$

$P = 58.5$ units

2.



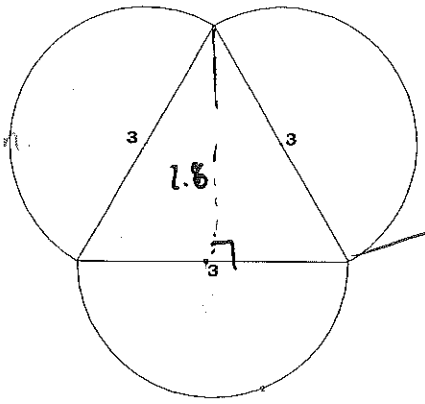
$A = \frac{66 \cdot 16}{2}$

$A = 528 \times 5$

2640 sq. mm

$P = 18 \cdot 11 = 198$ mm

3.



$C = \frac{2\pi r}{2} = 4.71$ un. $\times 3$

$P = 14.18$ units

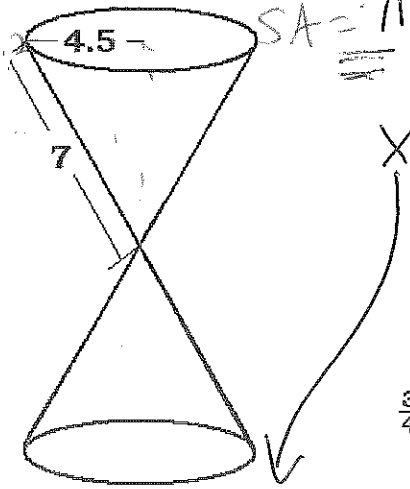
$O: 10.6$

$\triangle: 3.9$

$A = 14.5$ sq. units

Find the surface area of the following shapes.

4. The cones are identical

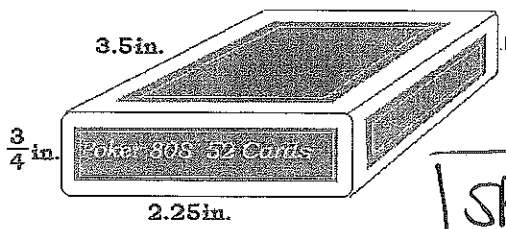


$SA = \pi \cdot 4.5 \cdot 7 + \pi \cdot 4.5^2$

$= 162.58$ sq. un.

$\times 2$

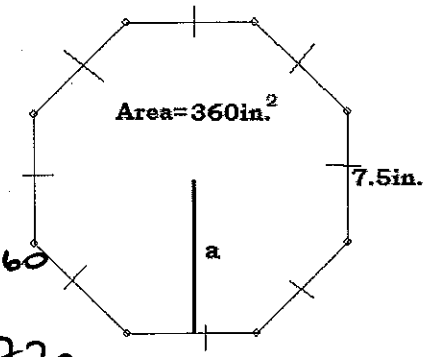
$SA = 325.15$ sq. units



$SA = 2(2.25 \times 0.75) + 2(3.5 \times 0.75) + 2(3.5 \times 2.25)$

$SA = 27$ sq. in

5.

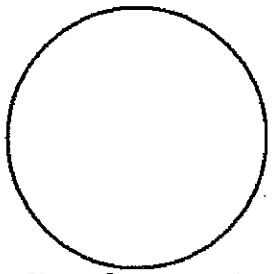


$P = 60$

$\frac{a \cdot 60}{2} = 360$

$a \cdot 60 = 720$

$a = 12$ in



$2 \cdot R \cdot \pi = 90\pi$

$2R = 90$

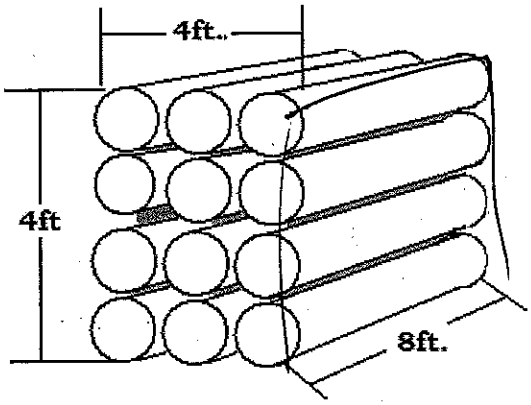
$R = 45$

$A = R^2 \cdot \pi$

$= 45^2 \cdot \pi$

$A = 2025\pi$ or 6361.73

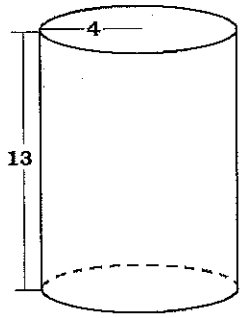
6. This stack of logs need to be covered with a plastic sheet. What are the dimensions of the plastic sheet that will cover this stack?



12' by 16'

Find the Volume of these 3D objects.

7.

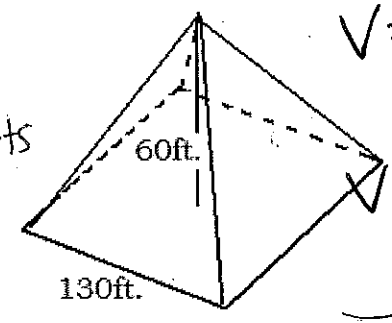


$V = \pi(4)^2 \cdot 13$

$V = 208\pi$

$V = 653.45$ cu. units

8.

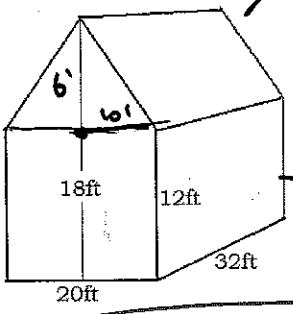


$V = \frac{BA \cdot h}{3}$

$= \frac{16,900 \cdot 60}{3}$

$V = 338,000$ cu. ft

9.



$V = \frac{6 \cdot 20}{2}(32)$

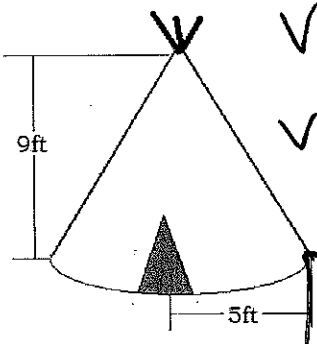
$V = 1920$

$V = 20 \cdot 32 \cdot 12$

$= 7680$

$V = 9600$ cu. ft

10.



$V = \frac{\pi r^2 \cdot h}{3}$

$V = \frac{\pi \cdot 5^2 \cdot 9}{3}$

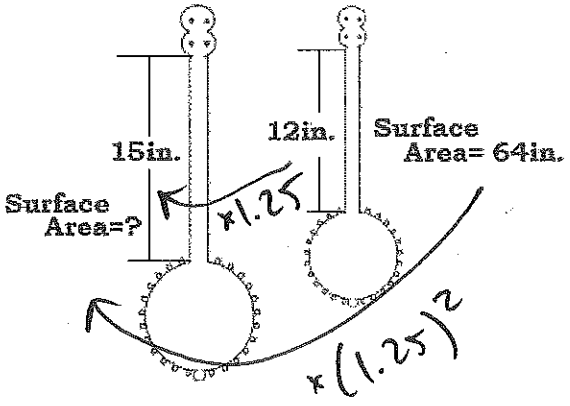
$V = 75\pi$ cu. ft

or

235.62 cu. ft

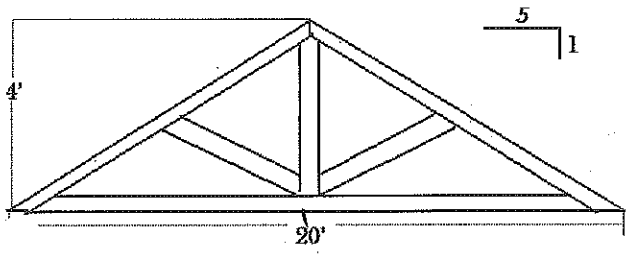
G2: Similarity

11. The following banjos are similar in shape. Find the surface area of the larger banjo.



SA = 100 sq. in

12. Do the measurements for this truss match the given pitch needed?

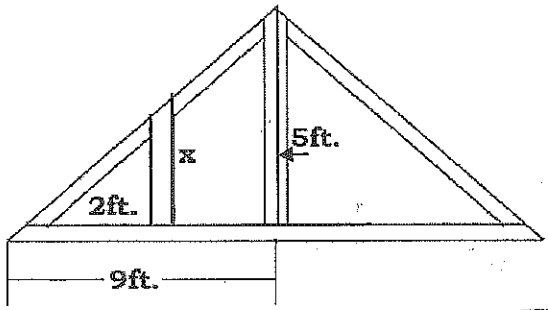


10

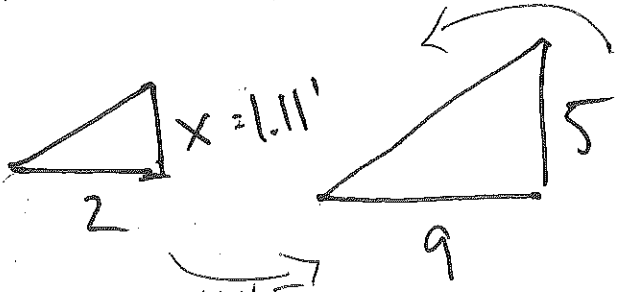
$\frac{1}{5} = 0.2$ No, they don't.

$\frac{4}{10} = 0.4$

13. Find the unknown length. All wood in the diagram are 2x4s.



1' 1 5/16"



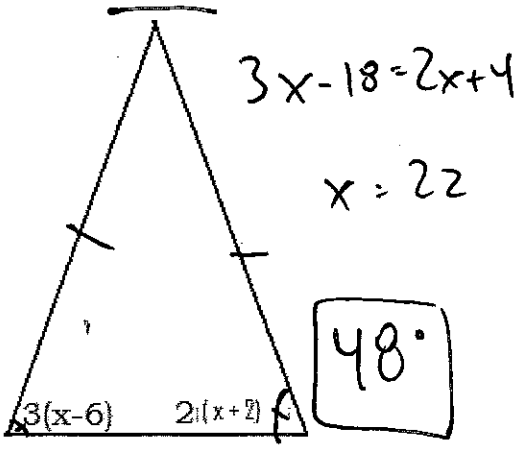
$x = \frac{5}{4.5} = 1.11'$

Scale factor = $\frac{9}{2} = 4.5$

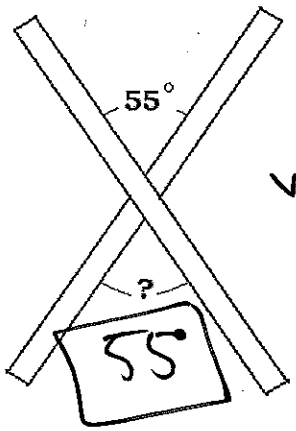
G3: Lines, Angles and Transformations

Find the Unknown ANGLES

14. An Isosceles

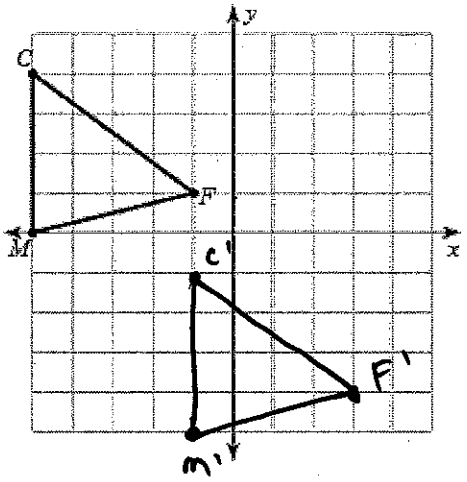


15. Two boards crossed

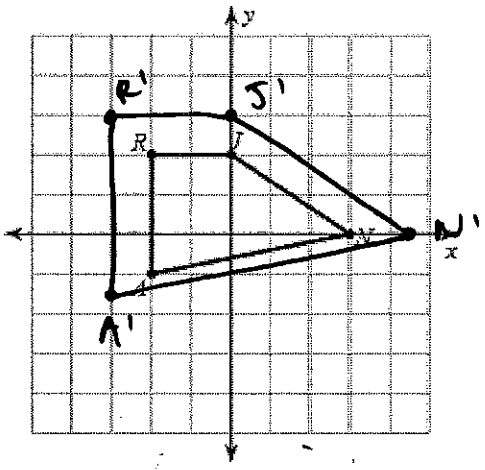


Graph the image of the figure using the transformation given.

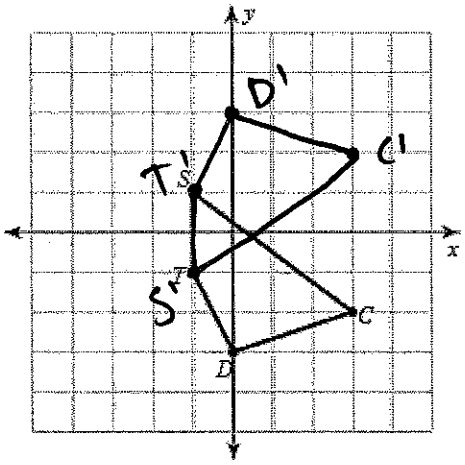
16) translation: 4 units right and 5 units down



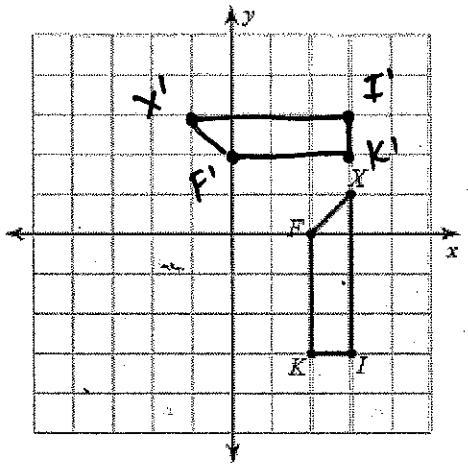
17) dilation of 1.5



18) reflection across the x-axis

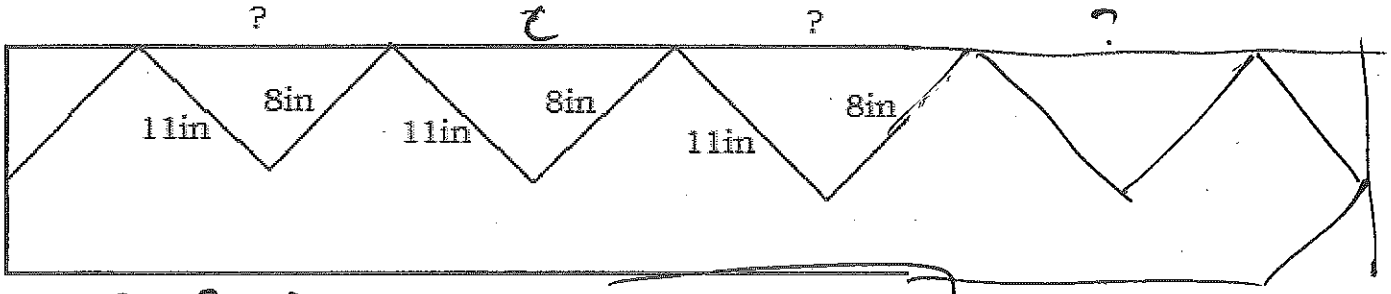


19) rotation 90° counterclockwise about the origin



G4: Trigonometry

20. The following is the beginning of a blueprint for a stringer. Suppose you needed to have **five steps**, how long should you cut your stringer?
(careful about how many "?" there really are.)



$8^2+11^2=c^2$

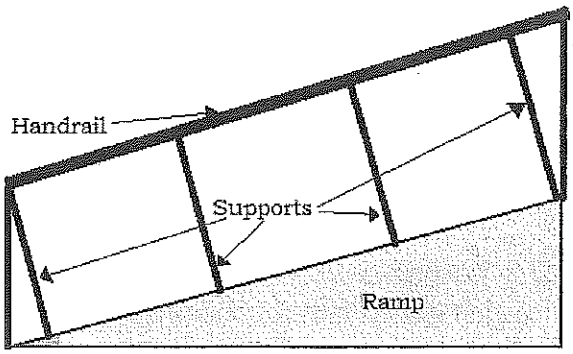
$64+121=c^2$

$c=13.6$ x5

68 inches

21. The ramp to the right has a slope gradient of 12%. **What is the slope of the handrail, represented as a fraction?**

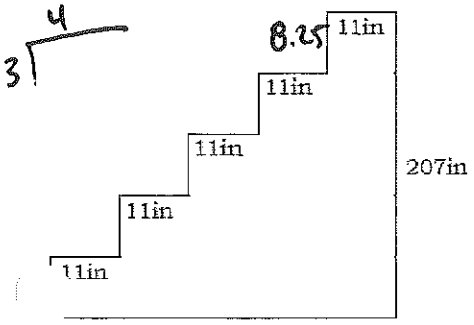
$\frac{12}{100}=\frac{3}{25}$



___. The supports on this same ramp are perpendicular to the handrail and the ramp. **What is the slope of each of the supports?** Write your answer as both a fraction and decimal.

$-\frac{25}{3}=\frac{-100}{12}=-8.33$

23. State code requires that steps in households cannot have a slope larger than ¾. Given that the steps are **11in wide** and the height needed to go is **207in.**, how many whole steps are required to keep the slope of the stairs up to code?

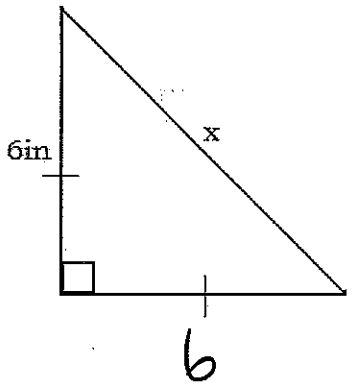


26 steps

$\frac{207}{8.25}=25.09$ steps

Rounding down would make the slope bigger than 3/4, so we have to round up to 26 steps.

24. Find the exact value of x



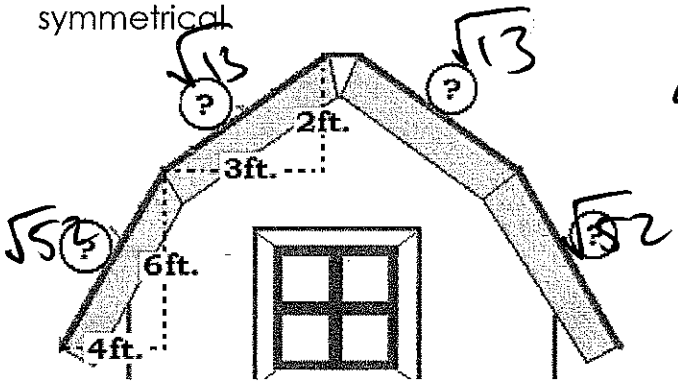
$6^2+6^2=x^2$

$36+36=x^2$

$72=x^2$

$x=\sqrt{72}$ in

25. What is the combined length of all four boards on this barn? Right and left halves are symmetrical.



$3^2+2^2=c^2$

$9+4=c^2$

$13=c^2$

$4^2+6^2=c^2$

$16+36=c^2$

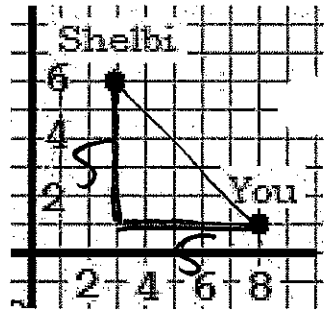
$52=c^2$

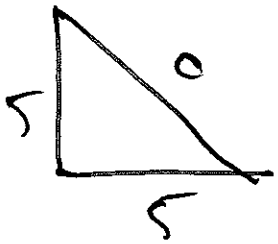
$\sqrt{52}+\sqrt{13}+\sqrt{13}+\sqrt{52}$

$=21.63$ ft

$=21'\ 7\frac{9}{16}''$

26. You and your friend Shelbi are lost. You use your navigation device to get each other's coordinates, then draw a map of where you are. What is the distance between you two?





$5^2+5^2=c^2$

$25+25=c^2$

$c^2=50$

$c=\sqrt{50}$

$c\approx 7.07$ units