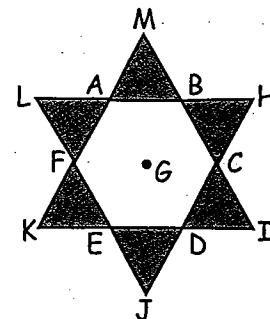
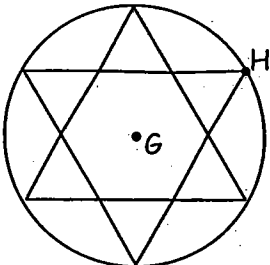


9. sq units The extension of other pairs of sides, in the manner used in the previous problem, results in a six-point star, as shown. What is the total area of the shaded regions? Express your answer as a common fraction in simplest radical form.

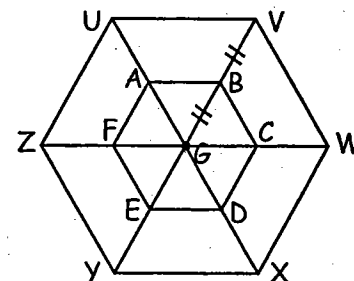


10. units 

A circle with radius GH is drawn to circumscribe the six-point star. How long is the radius of this new circle? Express your answer in simplest radical form.

11. sq units What is the difference between the area of the circle circumscribed about the six-point star and the area of the circle inscribed in the original hexagon? Express your answer as a common fraction in terms of π .

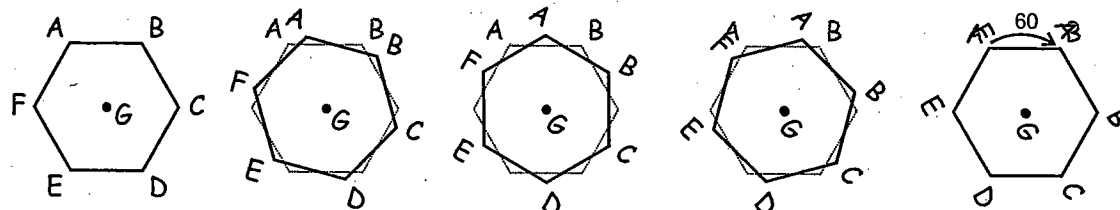
12. sq units Segment GB is extended to point V such that $GB = BV$. Likewise, GC, GD, GE, \dots are extended such that $GC = CW; GD = DX; GE = EY, \dots$ What is the area of trapezoid $BCWV$? Express your answer as a common fraction in simplest radical form.



13. What is the ratio of the length of a side of hexagon $ABCDEF$ to the length of a side of hexagon $UVWXYZ$? Express your answer as a common fraction.

14. What is the ratio of the area of hexagon $ABCDEF$ to the area of hexagon $UVWXYZ$? Express your answer as a common fraction.

15. deg If point G is held fixed and hexagon $ABCDEF$ is rotated 60 degrees clockwise (shown below in four steps) such that point A moves to the previous location of point B , the resulting hexagon has the exact same orientation. What is the maximum number of degrees less than 500 degrees that this figure can be rotated clockwise and maintain its exact same orientation?



NUMBER SENSE STRETCH

1. A four-digit number is divisible by 5 but not by 10. The tens digit is greater than 4 and is a power of 3. The hundreds digit is greater than 4 and is a power of 2. The thousands digit is less than 4 and is a power of 2 and of 3. What is the four-digit number? 1. _____

2. There are more than 12 but fewer than 32 students in Al Gorithm's class. When grouped by twos, there was one student left. When grouped by threes, there were two students left. When grouped by fours, there were three students left. How many students are in the class? 2. _____

3. As x increases from 0 to 1, how many of the following also increase? $x+1$, x^2 , $1/x$, $1-x^2$, $1-x$, $x-1$, $1/x^2$ 3. _____

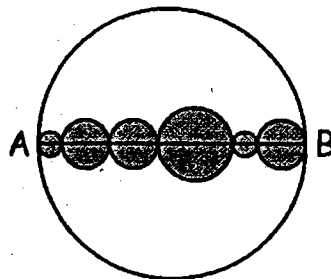
4. A two-digit number and the number formed by reversing its digits are added. What is the largest integer that will always divide the sum? 4. _____

5. The greatest common factor of two numbers is 14, and the least common multiple is 168. If the two numbers are not 14 and 168, what is their sum? 5. _____

ANSWER KEY:

PROPORTIONAL REASONING STRETCH

6. Diameter AB is equal to the sum of the six smaller diameters. What is the number of units in the difference between the circumference of the largest circle and the combined circumferences of the six smaller circles?



6. _____

7. The rectangular courthouse in Pleasantville measures 1980 ft by 440 ft. One square mile equals 640 acres. How many acres does the courthouse cover?

7. _____

8. Xa worked 2 hours and 15 minutes, Yo worked 1 hour and 40 minutes, and Zu worked 2 hours and 30 minutes. Combined, they were paid \$77. If each of them is paid the same hourly wage, how many dollars should Xa receive?

8. _____

9. Homer paid \$3 for 6 donuts. At this rate, how many dollars would Homer pay for 3 dozen donuts?

9. _____

10. A page of 12-point type contains 500 words; a page of 10-point type contains 660 words. A student printed a report using 10-point type, and the result was 25 full pages. If she prints it in 12-point type, how many pages will the report contain?

10. _____

