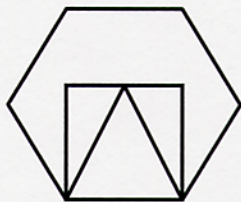


Geometry Individual Test
FAMAT State Convention 2002

For all questions, answer E. "NOTA" means none of the above answers is correct.

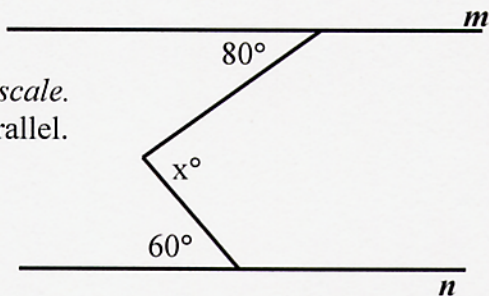
- 1) Find the y-intercept of the line that is tangent to the circle $[X^2 + (Y-3)^2 = 25]$ at $(4,0)$.
 A) $7/3$ B) 5 C) 2 D) $-16/3$ E) NOTA

- 2) Find the ratio of areas of the equilateral triangle, to Square, to regular hexagon, that have a common side.
Figure not drawn to scale.



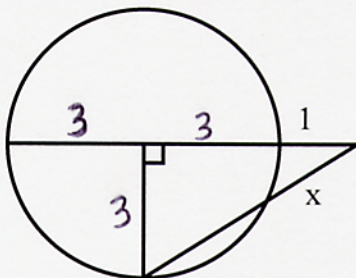
- A) $2 : 3 : 4$ B) $\sqrt{3} : 4 : 6\sqrt{3}$ C) $\sqrt{2} : 2 : 3$ D) $2\sqrt{2} : 2\sqrt{3} : 2\sqrt{5}$ E) NOTA

- 3) Find the value of x .
Figure not drawn to scale.
 Lines m and n are parallel.



- A) 140° B) 20° C) 110° D) 160° E) NOTA

- 4) Find the exterior segment length labeled x



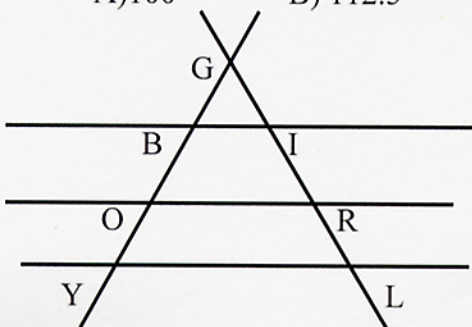
- A) $4/3$ B) 1 C) $7/5$ D) 3 E) NOTA

- 5) In right triangle ABC with right angle at C, if the $\sin A = 4/5$ for A an acute angle of the triangle, find $\cos A$.

- A) $5/4$ B) $3/5$ C) $1/5$ D) $4/9$ E) NOTA

- 6) In regular octagon RELATION find the measure of angle EAT?

- A) 100° B) 112.5° C) 135° D) 123.5° E) NOTA



- 7) \overline{BI} , \overline{OR} , and \overline{YL} are parallel. IR is one fourth of RL.
IR is one sixth of BO. IR is what fractional part of YO?
A) $2/3$ B) $1/24$ C) $1/36$ D) $1/72$ E) NOTA
- 8) Given M(10,-9) and N(-4,12); One of the two points that separates segment MN into two segments which are of length less than MN with a ratio of 3 to 4, is (4,0). Name the other.
A) (2,3) B) (3,1.5) C) (6,3) D) (5,5) E) NOTA
- 9) What is the $|xy|$, where (x,y) is a point 6 units from the origin on the line $y=x$?
A) 12 B) 32 C) $6\sqrt{2}$ D) 18 E) NOTA

- 10) The product of AC and GE is a two-digit integer whose one's digit is a positive prime. Which length of AC makes triangle ABC similar to triangle GFE?

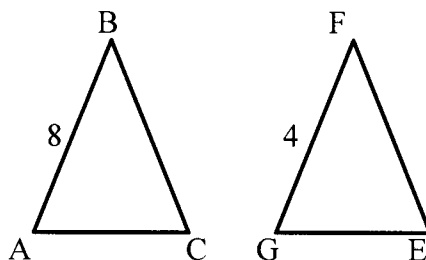
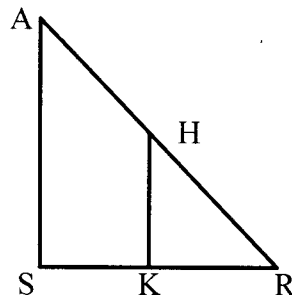


Figure not drawn to scale.

- A) 7 B) 10 C) 12 D) 14 E) NOTA
- 11) What is another proper name for the altitude originated at the vertex angle of an isosceles triangle?
I. Perpendicular Bisector of the base
II. Median of the triangle
III. Angle Bisector of the triangle
A) I & III B) I, II, & III C) II only D) II & III E) NOTA
- 12) The ratio of dark to light squares on a square game board (starting with dark and alternating to light) has a ratio of 1.025. How many total squares COULD BE on the board?
A) 49 B) 64 C) 81 D) 121 E) NOTA
- 13) Find the perimeter of a regular polygon with sides of length 13 cm and interior angles measuring 156° each.
A) 312 cm B) 195 cm C) 215 cm D) 323 cm E) NOTA
- 14) HK is the perpendicular bisector of SR. H is the midpoint of RA. Angle A = 45° . HK = 7. Find the area of right triangle SAR.

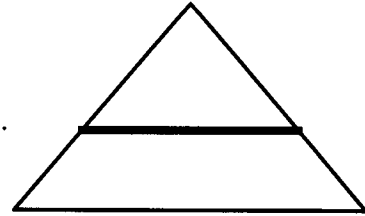
- A) 49 B) 128 C) 81
D) 98 E) NOTA



- 15) Three lines contain the three altitudes of triangle ABC. Which line has the greatest y-intercept? Given: A (10,8), B (-4,-12), C (6,-8)
- A) The altitude from A B) The altitude from B
C) The altitude from C D) Can Not be Determined
E) NOTA

- 16) Pictured to the right, five ninths the area of the large equilateral triangle is used to form a trapezoid. Which is true about the length of the smaller base of the trapezoid?

- A) It is twice the length of the apothem in the original triangle.
B) It is two-thirds the length of the trapezoid's larger base.
C) It is an altitude of the original triangle.
D) It is $\frac{5}{9}$ the length of the perimeter in the equilateral triangle.
E) NOTA



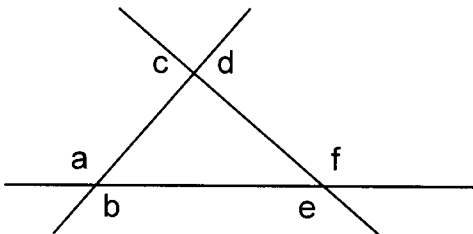
- 17) A dollar bill has an original width of 3 inches. The length of the width is photocopied such that the copy has a size that is 120% of the original. Then that new photocopy is reduced by 20%, what is the width of the final photocopied bill?
- A) less than 3 inches B) exactly 3 inches C) more than 3 inches
D) can not be determined E) NOTA

- 18) The centroid of a triangle is the intersection of its:
- A) Angle Bisectors B) Medians C) Altitudes
D) Perpendicular Bisectors E) NOTA

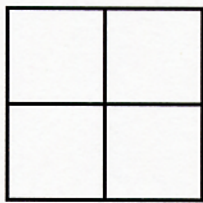
- 19) Find the length, in inches, of belting needed to pass around two congruent circular pulleys 16 inches in diameter whose centers are 60 inches apart.
- A) $60 + 32\pi$ B) $120 + 16\pi$ C) 128π D) $180 + 128\pi$ E) NOTA

- 20) The three lines intersect as shown in the figure below.
Find the value of $a+b+c+d+e+f$.

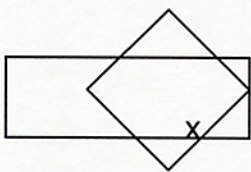
- A) 360° B) 540° C) 720° D) 900° E) NOTA



- 21) For a given circle, which of the following has the greatest measure? (excluding units)
- A) Circumference B) The product of the radius and diameter
C) Area D) Can not be determined E) NOTA



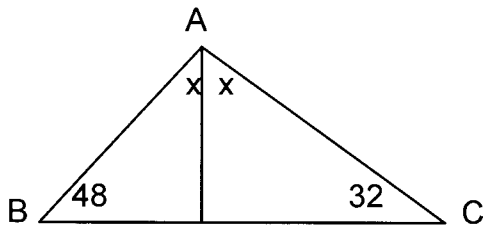
- 22) The figure above is a square divided into four equal smaller squares. If the perimeter of the larger square is 1, then the perimeter of a smaller square is ?
 A) $1/16$ B) $1/6$ C) $1/4$ D) $1/2$ E) NOTA
- 23) In a circle with radius 12 inches, a chord is 4 inches from the center. What is the length of the chord?
 A) 16 B) $16\sqrt{2}$ C) $8\sqrt{10}$ D) $4\sqrt{10}$ E) NOTA
- 24) What is the positive difference between the geometric mean of 9 and 4 with the arithmetic mean of 9 and 4?
 A) 6 B) 0 C) 0.5 D) 7.2 E) NOTA
- 25) The supplement of a certain angle is four times the measure of the complement of that certain angle. What is the measure of the certain angle?
 A) 60° B) 36° C) 54° D) 120° E) NOTA
- 26) Find the total surface area of a prism whose faces are all squares with sides of 10.
 A) 100 B) 300 C) 350 D) 600 E) NOTA



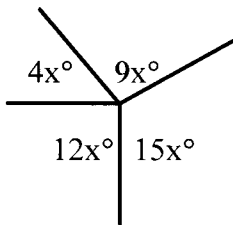
- 27) In a figure above (*not drawn to scale*), a square and a rectangle overlap. Which of the following is equal to the measure of the angle marked x ?
 A) 120° B) 135° C) 140°
 D) Can Not Be Determined E) NOTA
- 28) If the figure to the right is the mirror image of an accurate clock, what time will it be 15 minutes after the time shown?



- A) 1:50 B) 1:40 C) 1:10 D) 10:40 E) NOTA



- 29) In Triangle ABC above (*not drawn to scale*), what is the value of x ?
- A) 40° B) 42° C) 50° D) 58° E) NOTA



- 30) In the figure above (*not drawn to scale*) with angles measures as marked, what is the value of $4x^2$?
- A) 324 B) 362 C) 64 D) 1296 E) NOTA