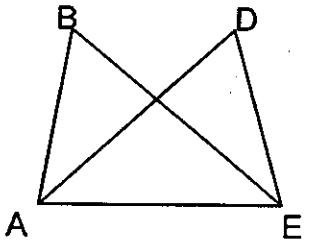
Team Questions for sponsors
Geometry February Regional

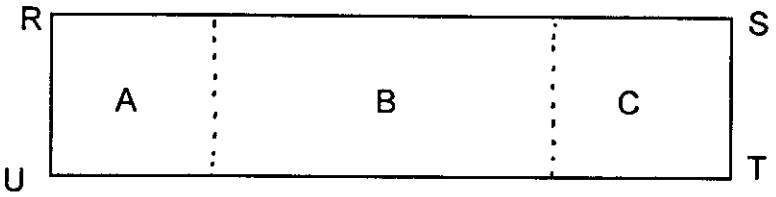
Question #1
Geometry February Regional

Using the diagram, not drawn to scale, $m\angle ABE = 50, m\angle AE = 80,$ $m\angle DEB = 10, m\angle DAE = 2m\angle BAD.$ Find $m\angle AEB.$



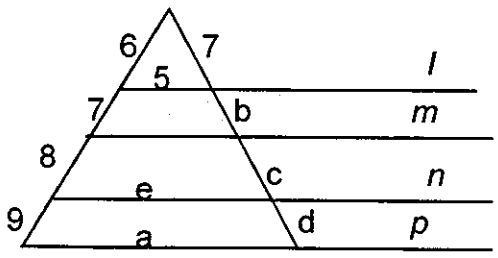
Question #2
Geometry February Regional

In the diagram, the rectangle RSTU with RU=4 and RS=18.
If squares A and C are folded across the dotted segments so that the areas of C and A cover parts of B, find the area of B that will NOT be covered by either square.



Question #3
Geometry February Regional

Lines *l*, *m*, *n*, and *p* are parallel as shown.
Diagram is not drawn to scale.
Find b + c + d + e + a.



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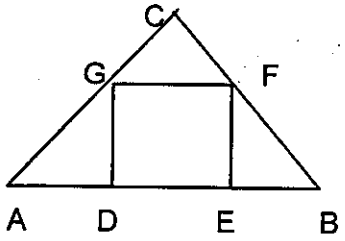
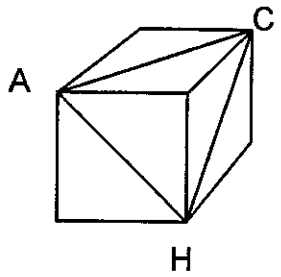
Question #4
Geometry February Regional

In the diagram, DEFG is a square, angle C is a right angle, AD=8, EB=12.
Find the exact area of quadrilateral ABFG.



Question #5
Geometry February Regional

A cube of edge 6 is shown. Give the exact area of triangle ACH
created by the diagonals of the 3 faces of the cube.



Question #6
Geometry February Regional
Determine whether or not each statement is true or false.
Assign each true statement a value of 1 and and each false statement a value of -1.
Find the sum of the 7 values.

1. Every diameter of a circle is a secant of the circle.
2. All radii of a sphere are congruent.
3. Every diameter of a sphere is the diameter of a great circle.
4. Every radius of a circle is a chord of the circle.
5. Every secant of a sphere intersects the sphere in exactly one point.
6. Every chord of a circle contains exactly 2 points of the circle.
7. A sphere and a great circle of the sphere have the same center and the same radius.

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Question #7
Geometry February Regional

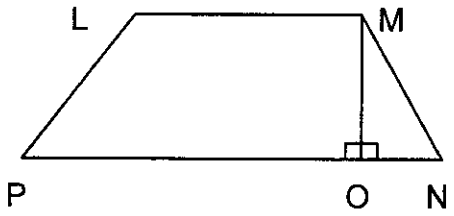
The area of square ABCD is 64. MNOP is formed by joining the midpoints of the sides of ABCD.

R = the area of MNOP
S = the perimeter of ABCD
T = the perimeter of MNOP
U = the length of a diagonal of ABCD
V = the length of a diagonal of MNOP

Find the value of $\frac{T}{U}+\frac{R+S}{V}$.

Question #8
Geometry February Regional

Find the length of the median of the trapezoid with bases $\overline{LM}$ and $\overline{PN}$.
The area of the trapezoid is 112, LM = 4, LP = PO = 10.



Question #9
Geometry February Regional

Which length is greatest?
A = the circumference of a circle with a 4 inch radius
B = the diagonal of a square with a side of 8 inches
C = the perimeter of a 3 inch by 4 inch rectangle
D = the diameter of a circle with a radius of 3 inches

On your answer sheet, give the letter of your answer.

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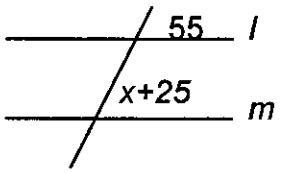
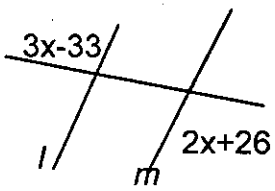
Question #10
Geometry February Regional

Each diagram represents a different value of x.
In each diagram, determine the value of x which makes $l \parallel m$.
Find the sum of all values of x.

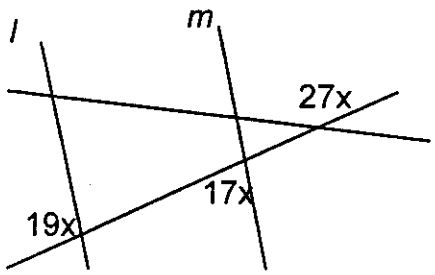
A.



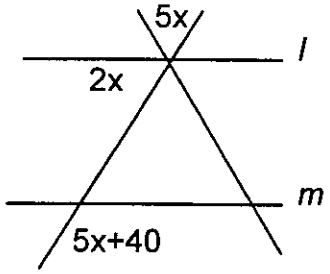
B.



C.

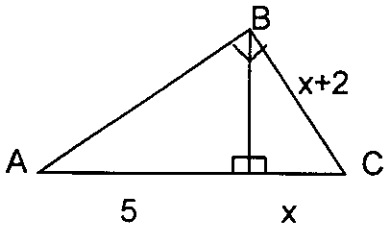


D.



Question #11
Geometry February Regional

Find the exact area of triangle ABC.



Question #12
Geometry February Regional

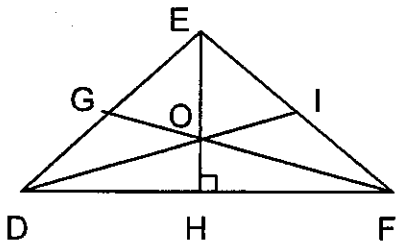
In the triangle, O is the centroid of ΔDEF, $\overline{EH} \perp \overline{DF}$, $DE = EF$, $DH = 9$, $DG = 7.5$, $OH = 4$.

Find each of the following, then evaluate $\frac{C}{B} + A$.

A = the length of $\overline{HF}$

B = length of $\overline{EO}$

C = the perimeter of ΔDEF given $DE = EF$



Question #13
Geometry February Regional

Given a triangle with angle measures $6x + 11$, $5x - 1$, and $3x + 2$,

A = the sum of the smallest interior angle of the triangle and the smallest exterior angle of the triangle

B = the measure of the larger angle formed when the angle bisector of the smallest angle intersects the opposite side of the triangle

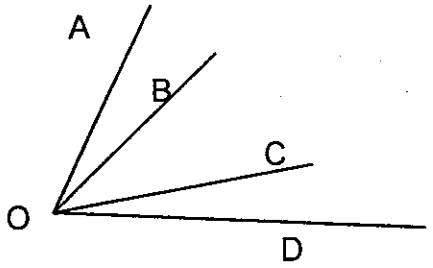
Find A – B.

Question #14
Geometry February Regional

Find the measure of $\angle AOD$ given

$m\angle AOC = 7x - 2, m\angle AOB = 2x + 8, m\angle BOC = 3x + 14,$

$\angle AOB \cong \angle COD.$



Question #15
Geometry February Regional

An isosceles triangle has two angles measuring 49 and 82. What is the measure of the third angle?