! Time - 120 minutes

Rules: For each problem from 1 to 60 you receive1 point and there is only one correct answer.

Organizing committee wishes a successful work!

Name……………………………………………….School ………………..   City……………

1. Points J, K, and L lie on a circle whose center is point O. If $\overline{JK}$ passes through O, which of the following is true about triangle LOK?
a) All three angles are less than 90^0 b) One angle measures exactly 90^0 c) At least one angle is greater than 90^0 d) At least two of the angles have the same measure   e) KO=KL

2. Let x represent the average (arithmetic mean) of a list of test scores. What is the result of multiplying x by the number of scores?
a) the average of the scores   b) the highest score   c) the number of scores   d) the number of possible scores e) the sum of the scores

3. In the figure, the area of the shaded region is 75 square units. What is the height of the smaller triangle?
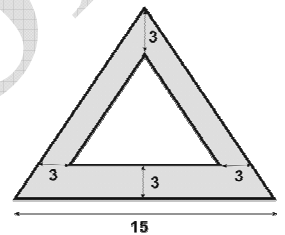
4. The total cost of a car rental is the sum of
    (1) A basic fixed rental charge for the car, and
    (2) An additional Charge for every 25 miles traveled.
If the total cost to rent a car and drive it 50 miles is $200 and the total cost to rent a car 450 miles?
(Disregard the $ sing when gridding your answer. If, for example, you answer is $1.37, grid 1.37.)

5. If you add some number j to 50, and then divide this sum by j, the result is 3. What is the value of j?
a) 5   b) 10   c) 15   d) 20   e) 25

6. Which of the following represents the same value as 0.00326691?
a) 3.26691×10^{-3} b) 3.26691×10^{-2} c) 3.26691×10^{-1} d) 32.6691×10^{-2} e) 32.6691×10^{-3}

7. . In xy-coordinate plane, the graph of $x = 2y^2 + 3$ intersects the line l at (5,*s*) and (11,*d*), what is the greatest slope of the line l?
a) 1/4   b) 2   c) 1   d) 1/2   e)4

8. While biking on a 50 mile path, Jerry averages 5 miles per hour for the first h hours. In terms of h, where h < 10, how many miles remain to be traveled?
a) 50/5h   b) 50-5h   c) 250h   d) 50-5/h   e) 5h-50

9. At a certain school, if the ratio of teachers to students is 1 to 10, which of the following could be the total number of teachers and students?
a) 100 b) 121 c) 144 d) 222 e) 1,011

10. In a display consisting of one row of coins, there are an equal number of silver and gold coins. Which of the following must true?
a) The first coin and the last coin are different types   b) There are тwo adjacent gold coins in a row
    c) There are two adjacent silver coins in a row   d) If there are two adjacent silver coins, there are also two gold coins   e) If the last two coins are gold, there are at least two adjacent silver coins.

11. After 6 new cars entered the parking lot and 2 cars left the parking lot, there were 2 times as many cars as before. How many cars were parked in the parking lot before the changes?
a) 2   b) 4 c) 6   d) 8   e) 10

12. Four students reach into a bag of coins. Steve grabs 1/3 of the coins, Joe grabs 1/4 , and Kyle grabs 1/6. If Ryan gets the remaining 6 coins, how many coins were originally in the bag?
a) 12   b) 18   c) 24   d) 27   e) 281

13. If *a+2 > 5* and *a – 4 < 1*, which of the following could be a value for a?
a) 2   b) 3   c) 4   d) 5   e) 6

14. The four-digit number $\overline{7X7X}$ is divisible by 3 if X is replaced by which of the following digits?
a)4   b) 5   c) 7   d) 7   e) 9

15. If the perimeter of a regular polygon is 21, which of the following could be the length of one side of the polygon?
a) 6   b) 5   c) 4   d) 3   e) 2

16. If *a* is an odd negative number and *b* is a positive even number, which of the following must be even and positive?

a) *a+b*   b) *–ab*   c) ab   d) *b/a*   e) *b-a*

17. Patty uses 2 gallons of paint to cover 875 square feet of surface. At this rate, how many gallons will she need to cover 4,375 square feet of surface?

a) 2   b) 5   c) 8   d) 10   e) 15

18. A rectangular box is 24 inches long, 10 inches wide, and 15 inches high. If exactly 60 smaller identical rectangular boxes can be stored perfectly in this larger box, which of the following could be the dimensions, in inches, of these smaller boxes?

a) 2x5x6   b) 3x4x6   c) 3x5x6   d) 4x5x6   e) 5x6x12

19. If the sum of 4 numbers is between 53 and 57, then the average (arithmetic mean) of these 4 numbers could be which of the following?

a) $11\frac{1}{2}$ b) 12   c) $12\frac{1}{2}$ d) 13   e) 14

20. In quadrilateral *ABCD, if CD=6, BC=8, AB=5,* $\angle A=\angle C=90^0$, what is the length of *AD*?

a) 4   b) $3\sqrt{5}$ c) $5\sqrt{3}$ d) 10   e) 15

21. In a coordinate plane, if points *C(2,5), D(-1,2),* and *E(x,y)* lie on line l, which of the following could be the coordinates of point *E*?

a) (0,1)   b) (1,1)   c) (0,2)   d) (1,3)   e) (1,4)

22. If the fraction 1/21 equals the repeating decimal 0,0476190476190…, what is the 51st digit after the decimal point of the repeating decimal?

a) 0   b) 1   c) 4   d) 6   e) 7

23. If *a* is a nonzero integer and *b* is not an integer, which of the following could be an integer?

a) *a+b*   b) *a-b*   c) *ab*   d) *2a-b*   e) *b/a*

24. If the lengths of the sides of a certain are *a, b,* and *c*, which of the following statements could be true?

a) *c=b+a*   b) *c=b-a*   c) *c=2a+b*   d) *c+2=a+b+3*   e) *c+3=a+b+2*

25. If *xy>0, 1/x+1/y=5,* and *1/xy=6*, than *(x+y)/5=*

a) 1/25   b) 1/6   c) 1/5   d) 5   e) 6

26. At a basketball tournament involving 8 teams, each team played 4 games with each of the other teams. How many games were played at this tournament?

a) 64   b) 98   c) 112   d) 128   e) 224

27. The lengths of two sides of a triangle are *(x-2)* and *(x+2)*, when *x>2*. Which of the following ranges includes all and only the possible values of the third side y?

a) *0<y<x*   b) *0<y<2x*   c) *2<y<x*   d) *4<y<x*   e) *4<y<2x*

28. The average (arithmetic mean) of x and y is 7, and the average of *x, y*, and *z* is 10. What is the value of *z*?

a) 23   b) 17   c 1999   d) 2000   e) 2001

29. If *abcd=3* and *abce=0*, which of the following must be true?

a) *e=0*   b) *c=0*   c) *a>0*   d) *b<0*   e) *b>3*

30. During the 2000 fiscal year, a company made 1/7 oh its profits in the first quarter, 1/3 of its profits in the second quarter,1/2 of its profits in the third quarter, and the remaining $2 million in the fourth quarter. What were the total profits for the fiscal year?

a) $18 million   b) $36 million   c) $63 million   d) $84 million   e) $126 million

31. If $4^{4x+6}=64^{2x,}$ what is the value of x?

a) 1   b) 2   c) 3   d) 4   e) 5

32. If 5 more than 3 times a certain number is 3 less than the number, what is the number?

a) -7   b) -4   c) -1/2   d) 4   e) 7

33. The larger circle has center O and diameter AD. The smaller circle has diameter OA. If the area of the larger circle is 25π, what is the circumference of the shaded region?

a) 5π b) 10π c) 15π d) 20π e) 25π

34. If a linear function passes through the points (1,a), (2,b) and (4,18), what is the value of (3/2)b-a?

a) 4   b) 7   c) 9   d) 18   e) It cannot be determined from the information given
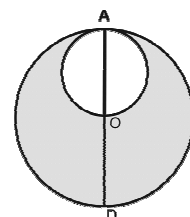
35. The first term in the sequence 4, -4, -1, … is 4. Each even-numbered term is found by multiplying the previous term by -1; each odd-numbered term is found by adding 3 to the previous term. What is the 37th term of the sequence?
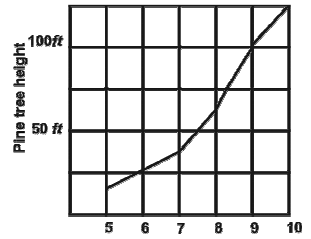a) -4   b) -1   c) 0   d) 1   e) 4

36. In the xy-plane, the equation of line l is y=3x+2. If line m is the reflection of line l in the y-axis, what is the equation of line m?
a) y=-3x+2   b) y=-3x-2   c) y=3x-2   d) y=(1/3)x+2   e) y=-(1/3)x+2

37 The graph shows a pine tree's height in feet from year 5 to year 10 of growth. What was the tree's percent increase in height from year 6 to year 9?
a) 25%   b) 75%   c) 200%   d) 300%   e) 400%

38. Which of the following has the same volume as the cylinder shown above with radius πx and height 2x?
a) a cylinder with radius 2x and height πx   b) a cube whit edge 2πx   c) a cylinder with radius 2πx and height x   d) a rectangular solid with dimensions 2x, πx, πx   e) a rectangular solid with dimensions πx, 2πx, πx
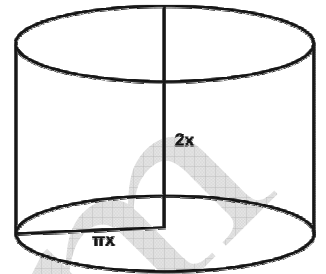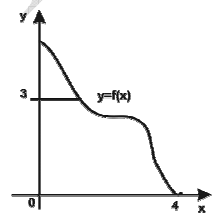
39. The shaded region in the figure is bounded by the x-axis, the y-axis, y=3 and the graph of y=f(x). If the point (m,n) is in the shaded region, which of the following must be true?
I. m≤3
II. n≥m
III. f(m)≥n
a) I only   b) III only   c) I and III   d) II and III   e) I, II, and III

40. A lumber company producing 13 inch boards can only sell ones cut between $12\frac{15}{16}$ and $13\frac{1}{16}$. If they sell a board that is x inches long, which of the following describes all possible values of x?
a) $|x-13|=1/16$ b) $|x+13|=1/16$ c) $|x-13|>1/16$ d) $|x+13|<1/16$ e) $|x-13|<1/16$

41. The least integer of a set of consecutive even integers is -30. If the sum of these integers is 66, how many integers are in the set?
a) 12   b) 14   c) 30   d) 33   e) 35

42 If 3/x+x=7+3/7, then x can equal which of the following?
a) 1/7   b) 3/7   c) 1   d) 7/3   e) 7

43. Which of the following numbers can be used to show that the "All numbers that are divisible by both 4 and 6 are also divisible 8" is FALSE?
a) 12   b) 24   c) 32   d) 40   e) 48

44. In the figure, the circle is tangent to sides AB and DC of the parallelogram ABCD, which has area 168. What is the area of the circle?
a) 12π   b) 26π   c) 36π   d) 49π   e) 144π
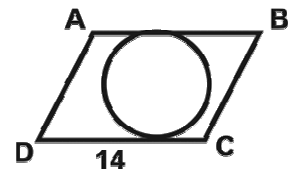
45. On the disk shown, a player spins the arrow twice and multiplies. On every spin, each of the numbered sector on which the arrow stops. What's the probability that the product is even?
a) 9/36   b) 12/36   c) 18/36   d) 24/36   e) 27/36
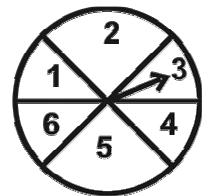
46. Which of the lettered points on the number line above could represent the result when the coordinate of point A is multiplied by the coordinate of point B?
a) V   b) W   c) X   d) Y   e) Z

47. A supermarket buys cartons of orange juice for k dollars each and then sells them for 4k/3 dollars each. How many cartons do they need to sell to make a profit of $2,000?
a) 2000/k   b) 1500/k   c) k/2000   d) k/6000   e) 6000k
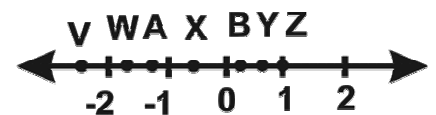
48. A family spent $500 on groceries in January. Due to price increases, they spent 25% more in February. How much did they spend on groceries in February? (disregard the $ when gridding your answer)

49. Each angle of ΔABC has the same measure as an angle in ΔJKL (not shown). If the length of one side of ΔJKL is 120, what is one possible greatest area of ΔJKL?
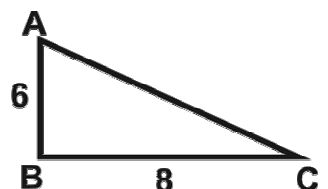
50. The sum of 5 consecutive integers is 500. What is the value of the median of these integers?

51. The figure above shows the graph of y=h(x). If the function k is defined by k(x)=h(x/2)+3, what is the value of k(-2)?

52. Five friends decide to go for a pony ride and have a choice of exactly 5 different ponies, any of which would be suitable for any friend. If each friend gets of ponies are possible?

53. It takes 5 complete turns of the crank to raise a fishing rod hook 2 feet. At this rate, how many turns will it take to raise the hook 4,4 feet?

a) 4,4   b) 11   c) 22   d) 33   e) 44

54. In the figure, $\overline{EB}$, $\overline{AD}$, and $\overline{CF}$ intersect at point A, and $\overline{EB} \perp \overline{AD}$. What is the value of (x+y)/2

a) 75^0 b) 90^0 c) 120^0 d) 135^0 e) 150^0

55. If 2x-8, x+4, and 3x-13 are all integers, and x+4 is the median of these integers, which of the following could be a value of x?

a) 6   b) 8   c) 11   d) 13   e) 15

56. A bookseller's net profit, in dollars, from the sale of b books is given by P(b)=2,5b-100. How many books must she sell in order to earn a net profit of $225?

a) 130   b) 225   c) 331   d) 463   e) 563

57. In the figure above, AB=1 and BD=2$\sqrt{2}$. What is the value of z?

a) 40^0 b) 45^0 c) 50^0 d) 55^0 e) 60^0

58. If 20 percent of 30 percent of a positive number is equal to 15 percent of h percent of the same number, what is the value of h?
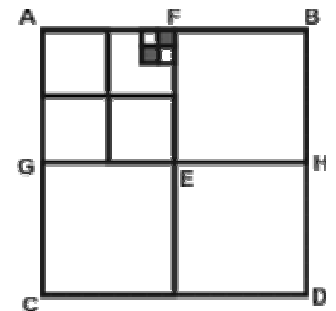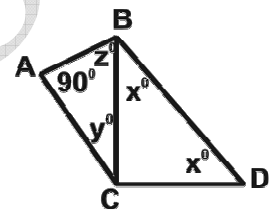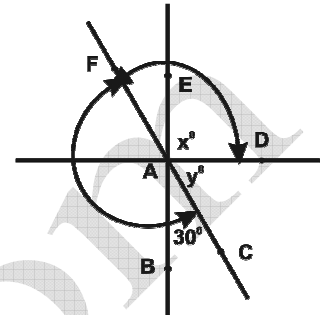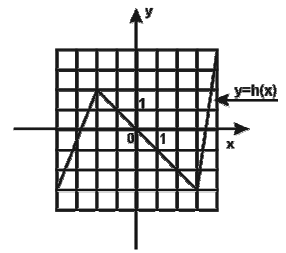
a) 30   b) 35   c) 40   d) 45   e) 60

59. In the figure right, each square is split into 4 squares of the same size. The total shaded area is what fraction of the area of square ABCD?

a) 1/256   b) 1/128   c) 1/64   d) 1/32   e) 2/13

60. If 3x<0<y, which of the following is greatest?

a) 0   b) y   c) -3x   d) –(3x+y)   e) –(3x-y)

1. Отговори 12 клас

1	D	8	B	15	D	22	E	29	A	36	A	43	A	50	100	57	$60°$
2	E	9	B	16	B	23	C	30	D	37	D	44	C	51	4	58	40
3	10	10	E	17	D	24	E	31	C	38	E	45	E	52	120	59	1/128
4	320	11	B	18	A	25	B	32	B	39	B	46	C	53	11	60	-3x-y
5	E	12	C	19	E	26	D	33	C	40	E	47	B	54	$135°$		
6	A	13	C	20	C	27	E	34	C	41	D	48	625	55	11		
7	D	14	b	21	E	28	C	35	E	42	E	49	9600	56	130		