33. For a population that grows at a constant rate of $r\%$ per year, the formula $P(t) = p_o\left(1 + \frac{r}{100}\right)^t$ models the population t years after an initial population of p_o people is counted.

The population of the city of San Jose was 782,000 in 1990. Assume the population grows at a constant rate of 5% per year. According to this formula, which of the following is an expression for the population of San Jose in the year 2000 ?

A. $782{,}000(6)^{10}$
B. $782{,}000(1.5)^{10}$
C. $782{,}000(1.05)^{10}$
D. $(782{,}000 \times 1.5)^{10}$
E. $(782{,}000 \times 1.05)^{10}$

34. Tom's long-distance service charges \$0.10 per minute from 7:00 P.M. to 7:00 A.M. on weekdays, all day on Saturdays, and all day on holidays; \$0.05 per minute all day on Sundays; and \$0.25 per minute at all other times. The table below gives his long-distance calls for 1 week, including the date and day of each call, the time it was placed, and the number of minutes it lasted.

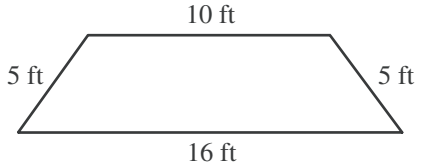
Date and day	Time	Number of minutes
11/22 Tuesday	5:00 P.M.	8
11/23 Wednesday	10:30 A.M.	10
11/24 Thursday Thanksgiving holiday	11:30 A.M.	15
11/26 Saturday	9:30 A.M.	17
11/27 Sunday	12:15 P.M.	22

What did Tom's long-distance service charge him for the calls in the table?

F. \$7.30
G. \$7.60
H. \$7.95
J. \$8.80
K. \$9.90

35. The parallel sides of the isosceles trapezoid shown below are 10 feet long and 16 feet long, respectively. What is the distance, in feet, between these 2 sides?

A. 3
B. 4
C. 5
D. 10
E. 16



36. The inequality $3(x + 2) > 4(x - 3)$ is equivalent to which of the following inequalities?

F. $x < -6$
G. $x < 5$
H. $x < 9$
J. $x < 14$
K. $x < 18$

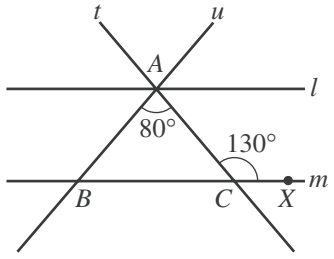
37. In the standard (x,y) coordinate plane, the midpoint of $\overline{AB}$ is (4,–3) and A is located at (1,–5). If (x,y) are the coordinates of B, what is the value of $x + y$?

A. 19
B. 8
C. 6
D. –1.5
E. –3

38. For all x in the domain of the function $\frac{x+1}{x^3 - x}$, this function is equivalent to:

F. $\frac{1}{x^2} - \frac{1}{x^3}$
G. $\frac{1}{x^3} - \frac{1}{x}$
H. $\frac{1}{x^2 - 1}$
J. $\frac{1}{x^2 - x}$
K. $\frac{1}{x^3}$

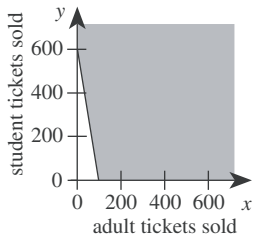
39. In the figure below, line l is parallel to line m. Transversals t and u intersect at point A on l and intersect m at points C and B, respectively. Point X is on m, the measure of $\angle ACX$ is 130°, and the measure of $\angle BAC$ is 80°. How many of the angles formed by rays of l, m, t, and u have measure 50° ?



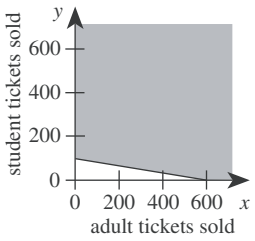
A. 4
B. 6
C. 8
D. 10
E. 12

40. Tickets for the Senior Talent Show at George Washington Carver High School are \$3 for adults and \$2 for students. To cover expenses, a total of \$600 must be collected from ticket sales for the show. One of the following graphs in the standard (x,y) coordinate plane, where x is the number of adult tickets sold and y is the number of student tickets sold, represents all the possible combinations of ticket sales that cover at least \$600 in expenses. Which graph is it?

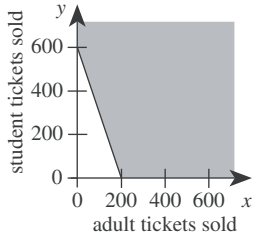
F.



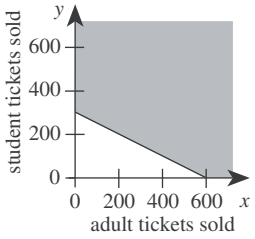
J.



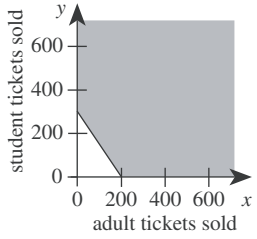
G.



K.



H.



41. What is the median of the following 7 scores?

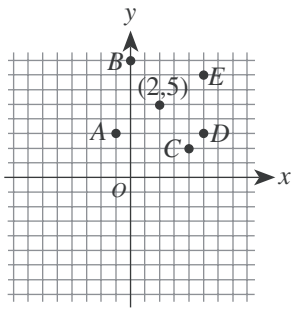
42, 67, 33, 79, 33, 89, 21

A. 42
B. 52
C. 54.5
D. 56
E. 79

42. What are the real solutions to the equation $|x|^2 + 2|x| - 3 = 0$?

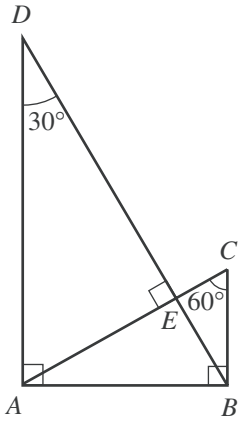
F. ±1
G. ±3
H. 1 and 3
J. –1 and –3
K. ±1 and ±3

43. The point (2,5) is shown in the standard (x,y) coordinate plane below. Which of the following is another point on the line through the point (2,5) with a slope of $-\frac{2}{3}$?



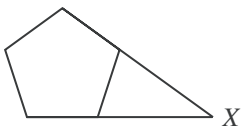
A. $A(-1,3)$
B. $B(0,8)$
C. $C(4,2)$
D. $D(5,3)$
E. $E(5,7)$

44. For the triangles in the figure below, which of the following ratios of side lengths is equivalent to the ratio of the perimeter of $\triangle ABC$ to the perimeter of $\triangle DAB$?



F. $AB:AD$
G. $AB:BD$
H. $AD:BD$
J. $BC:AD$
K. $BC:BD$

45. In the figure below, 2 nonadjacent sides of a regular pentagon (5 congruent sides and 5 congruent interior angles) are extended until they meet at point X. What is the measure of $\angle X$?



A. 18°
B. 30°
C. 36°
D. 45°
E. 72°

46. The edges of a cube are each 3 inches long. What is the surface area, in square inches, of this cube?

F. 9
G. 18
H. 27
J. 36
K. 54

47. A number is increased by 25% and the resulting number is then decreased by 20%. The final number is what percent of the original number?

A. 90%
B. 95%
C. 100%
D. 105%
E. 120%

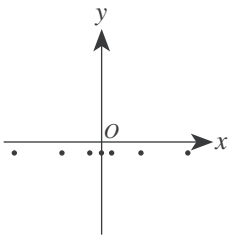
48. Two numbers are *reciprocals* if their product is equal to 1. If x and y are reciprocals and $x > 1$, then y must be:

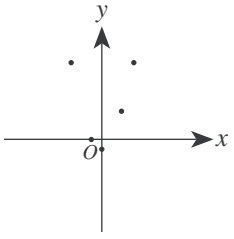
F. less than –1.
G. between 0 and –1.
H. equal to 0.
J. between 0 and 1.
K. greater than 1.

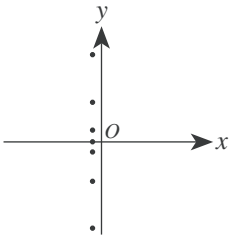
49. The number line graph below is the graph of which of the following inequalities?

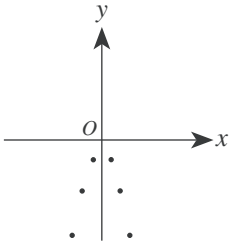
A. $-1 \leq x$ and $3 \leq x$
B. $-1 \leq x$ and $3 \geq x$
C. $-1 \leq x$ or $3 \leq x$
D. $-1 \geq x$ or $3 \leq x$
E. $-1 \geq x$ or $3 \geq x$

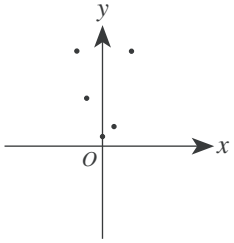
50. All of the following graphs have equal scales on the axes. One of the graphs shows only points for which the y-coordinate is 1 less than the square of the x-coordinate. Which one?

F.


J.


G.


K.


H.


51. In teaching a lesson on the concept of thirds, Ms. Chu uses a divide-and-set-aside procedure. She starts with a certain number of colored disks, divides them into 3 equal groups, and sets 1 group aside to illustrate $\frac{1}{3}$. She repeats the procedure by taking the disks she had NOT set aside, dividing them into 3 equal groups, and setting 1 of these groups aside. If Ms. Chu wants to be able to complete the divide-and-set-aside procedure at least 4 times (without breaking any of the disks into pieces), which of the following is the minimum number of colored disks she can start with?

A. 12
B. 15
C. 27
D. 54
E. 81

52. Which of the following is true for all consecutive integers m and n such that $m < n$?

F. m is odd
G. n is odd
H. $n - m$ is even
J. $n^2 - m^2$ is odd
K. $m^2 + n^2$ is even

53. A function P is defined as follows:

for $x > 0$, $P(x) = x^5 + x^4 - 36x - 36$
for $x < 0$, $P(x) = -x^5 + x^4 + 36x - 36$

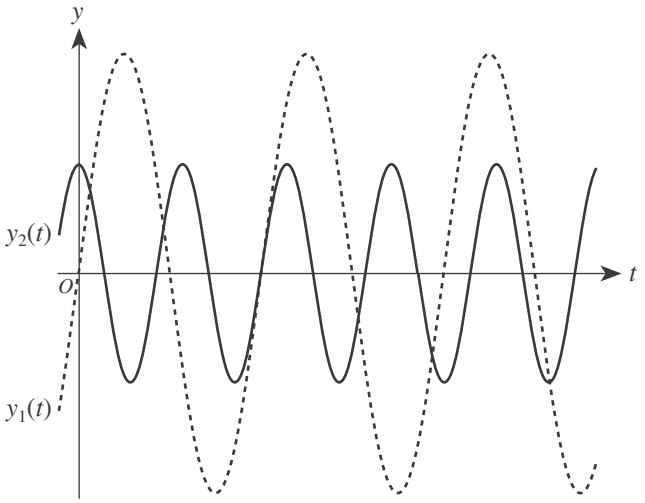
What is the value of $P(-1)$?

A. –70
B. –36
C. 0
D. 36
E. 70

54. For a project in Home Economics class, Kirk is making a tablecloth for a circular table 3 feet in diameter. The finished tablecloth needs to hang down 5 inches over the edge of the table all the way around. To finish the edge of the tablecloth, Kirk will fold under and sew down 1 inch of the material all around the edge. Kirk is going to use a single piece of rectangular fabric that is 60 inches wide. What is the shortest length of fabric, in inches, Kirk could use to make the tablecloth without putting any separate pieces of fabric together?

F. 15
G. 24
H. 30
J. 42
K. 48

55. The equations of the 2 graphs shown below are $y_1(t) = a_1 \sin(b_1 t)$ and $y_2(t) = a_2 \cos(b_2 t)$, where the constants b_1 and b_2 are both positive real numbers.



Which of the following statements is true of the constants a_1 and a_2 ?

A. $0 < a_1 < a_2$
B. $0 < a_2 < a_1$
C. $a_1 < 0 < a_2$
D. $a_1 < a_2 < 0$
E. $a_2 < a_1 < 0$

56. For x such that $0 < x < \frac{\pi}{2}$, the expression

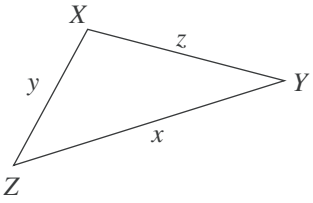
$$\frac{\sqrt{1-\cos^2 x}}{\sin x} + \frac{\sqrt{1-\sin^2 x}}{\cos x}$$ is equivalent to:

F. 0
G. 1
H. 2
J. $-\tan x$
K. $\sin 2x$

57. Consider the functions $f(x) = \sqrt{x}$ and $g(x) = 7x + b$. In the standard (x,y) coordinate plane, $y = f(g(x))$ passes through (4,6). What is the value of b ?

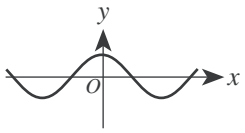
A. 8
B. –8
C. –25
D. –26
E. $4 - 7\sqrt{6}$

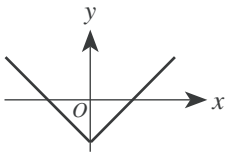
58. The triangle, $\triangle XYZ$, that is shown below has side lengths of x, y, and z inches and is not a right triangle. Let X' be the image of X when the triangle is reflected across $\overline{YZ}$. Which of the following is an expression for the perimeter, in inches, of quadrilateral $X'YXZ$?

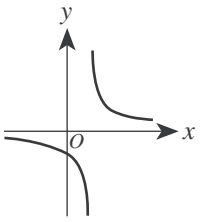


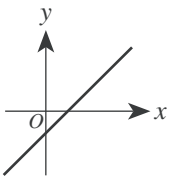
F. $2(y + z) + x$
G. $2(x + y + z)$
H. $2(x + y)$
J. $2(x + z)$
K. $2(y + z)$

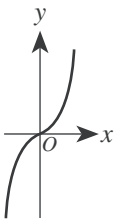
59. A function f is an *odd* function if and only if $f(-x) = -f(x)$ for every value of x in the domain of f. One of the functions graphed in the standard (x,y) coordinate plane below is an odd function. Which one?

A.


B.


C.


D.


E.


60. What is the real value of x in the equation $\log_2 24 - \log_2 3 = \log_5 x$?

F. 3
G. 21
H. 72
J. 125
K. 243

END OF TEST 2

STOP! DO NOT TURN THE PAGE UNTIL TOLD TO DO SO.

DO NOT RETURN TO THE PREVIOUS TEST.