

SLICK!

42. The number of decibels, d , produced by an audio source can be modeled by the equation $d = 10 \log\left(\frac{I}{K}\right)$, where I is the sound intensity of the audio source and K is a constant. How many decibels are produced by an audio source whose sound intensity is 1,000 times the value of K ?

- F. 4
- G. 30
- H. 40
- J. 100
- K. 10,000

A. REWRITE
 $d = 10 \log\left(\frac{I}{K}\right) =$
 B. NOTICE SLICK QUESTION
 $d = 10 \log\left(\frac{1000K}{K}\right) =$
 C. SOLVE RIGHT SIDE
 $d = 10 \log_{10} 1000 =$
 $d = 10 \cdot 3 = 30$
 D. MULTIPLY

43. Mario plays basketball on a town league team. The table below gives Mario's scoring statistics for last season. How many points did Mario score playing basketball last season?

Type of shot	Number attempted	Percent successful
1-point free throw	80	75%
2-point field goal	60	90%
3-point field goal	60	25%

- A. 129
- B. 190
- C. 213
- D. 330
- E. 380

B. MULT BY SCORE
 $80(1) = 80$
 $60(2) = 120$
 $15(3) = 45$
 C. ADD EM
 $80 + 120 + 45 = 245$
 A. MULT BY PERCENTAGE
 $245 \cdot 0.9 = 220.5$
 $220.5 + 24.5 = 245$

44. The graph of $y = |x - 6|$ is in the standard (x, y) coordinate plane. Which of the following transformations, when applied to the graph of $y = |x|$, results in the graph of $y = |x - 6|$?

- F. Translation to the right 6 coordinate units
- G. Translation to the left 6 coordinate units
- H. Translation up 6 coordinate units
- J. Translation down 6 coordinate units
- K. Reflection across the line $x = 6$

MOVEMENT RULES
 A. SET IT TO EQUAL 0
 $x - 6 = 0$
 $x = +6$
 TO THE RIGHT

SLICK: DISPLACEMENT

45. Toby wants to find the volume of a solid toy soldier. He fills a rectangular container 8 cm long, 6 cm wide, and 10 cm high with water to a depth of 4 cm. Toby totally submerges the toy soldier in the water. The height of the water with the submerged toy soldier is 6.6 cm. Which of the following is closest to the volume, in cubic centimeters, of the toy soldier?

- A. 125
- B. 156
- C. 192
- D. 208
- E. 317

A. SUBTRACT TO GET DIFF OF HEIGHT
 $6.6 - 4 = 2.6$
 B. MULTIPLY L.W. DIFF
 $8 \cdot 6 \cdot 2.6 = 124.8$

SLICK: VOLUME

46. A box in the shape of a cube has an interior side length of 18 inches and is used to ship a right circular cylinder with a radius of 6 inches and a height of 12 inches. The interior of the box not occupied by the cylinder is filled with packing material. Which of the following numerical expressions gives the number of cubic inches of the box filled with packing material?

- F. $6(18)^2 - 2\pi(6)(12) - 2\pi(6)^2$
- G. $6(18)^2 - 2\pi(6)(12)$
- H. $18^3 - \pi(6)(12)^2$
- J. $18^3 - \pi(6)^2(12)$
- K. $18^3 - \pi(12)^3$

A. NOTICE ALL ABOUT VOLUME
 VOL - VOL
 BOX - CYLIN
 $lwh - \pi r^2 h$
 $(18 \cdot 18 \cdot 18) - \pi(6)^2(12)$
 $18^3 - \pi(6)^2(12)$

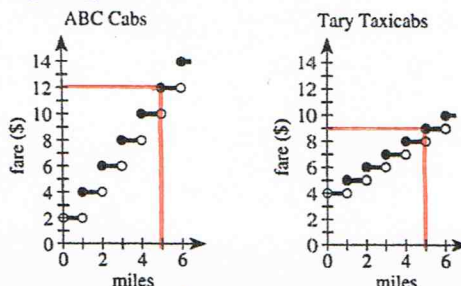
SLICK!

47. A room has a rectangular floor that is 15 feet by 21 feet. What is the area of the floor in square yards?

- A. 24
- B. 35
- C. 36
- D. 105
- E. 144

A. RATIO
 $\frac{F}{3} : \frac{Y}{1}$
 $\frac{15}{3} : \frac{21}{1}$
 $5 : 7$
 B. MULT YARDS
 $5 \cdot 7 = 35$

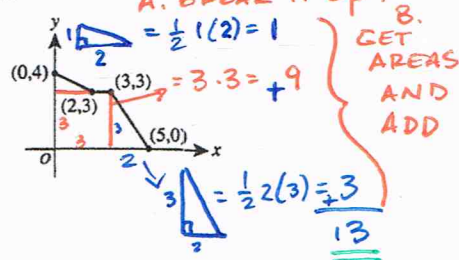
48. ABC Cabs and Tary Taxicabs both have an initial fare of a whole number of dollars for 1 passenger. The fare increases a whole number of dollars at each whole number of miles traveled. The graphs below show the 1-passenger fares, in dollars, for both cab companies for trips up to 6 miles. When the fares of the 2 cab companies are compared, what is the cheaper fare for a 5-mile trip?



- F. \$ 8
- G. \$ 9
- H. \$10
- J. \$11
- K. \$12

A. MARK IT UP!
 B. COMPARE \$9 CHEAPER = ONE

49. The graph of a function $y = f(x)$ consists of 3 line segments. The graph and the coordinates of the endpoints of the 3 line segments are shown in the standard (x, y) coordinate plane below. What is the area, in square coordinate units, of the region bounded by the graph of $y = f(x)$, the positive y -axis, and the positive x -axis?



- A. 10
- B. 13
- C. 14
- D. 15
- E. 20

SLICK

50. The sum of 2 positive numbers is 151. The lesser number is 19 more than the square root of the greater number. What is the value of the greater number minus the lesser number?

- F. 19
- G. 66
- H. 85
- J. 91
- K. 121

A. LABEL
 $L + G = 151$
 $\sqrt{G} + 19 + G = 151$
 B. PLUS
 $121 = \sqrt{121} + 19 + 121 = 151$
 $121 = 11 + 19 + 121 = 151$
 C. SO $G - L =$
 $121 - 30 = 91$

51. The list of numbers 41, 35, 30, X , Y , 15 has a median of 25. The mode of the list of numbers is 15. To the nearest whole number, what is the mean of the list?

- A. 20
- B. 25
- C. 26
- D. 27
- E. 30

A. LIST
 15
 $x = 15$
 $y = 20$
 MED
 25
 30
 35
 41
 $\frac{156}{6} = 26$

52. You are given the following system of equations:

$$\begin{aligned} y &= x^2 \\ rx + sy &= t \end{aligned}$$

where $r, s,$ and t are integers. For which of the following will there be more than one (x,y) solution, with real-number coordinates, for the system?

- F. $r^2 + 4st > 0$
- G. $s^2 - 4rt > 0$
- H. $r^2 - 4st < 0$
- J. $s^2 - 4rt < 0$
- K. $s^2 + 4rt < 0$

A. PLUG IN Y
 $rx + sx^2 = t$
B. SET TO 0
 $3x^2 + rx - t = 0$
C. DISCRIMINATION USE
 $b^2 - 4ac$
 $r^2 - 4(s)(-t)$
D. REDUCE
 $2 \text{ P.O.E. } r^2 + 4st$

SIDE NOTE
 IF > 0 MORE THAN ONE SOLUTION
 IF < 0 IMAGINARY
 IF $= 0$ ONLY ONE SOLUTION

53. The 3rd and 4th terms of an arithmetic sequence are 13 and 18, respectively. What is the 50th term of the sequence?

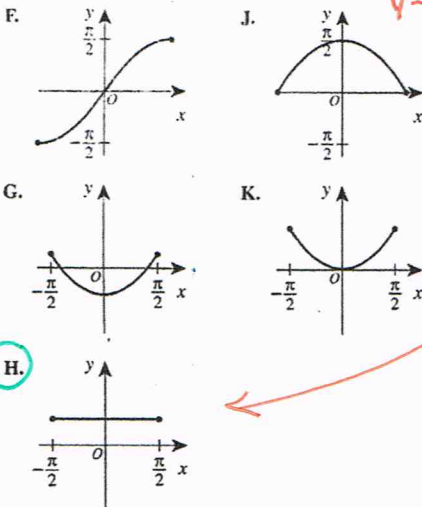
- A. 248
- B. 250
- C. 253
- D. 258
- E. 263

A. WRITE IT OUT

1	2	3	4	5	6	7	8	9	10
3	8	13	18	23	28	33	38	43	48

B. NOTICE TERM ENDING IN 0 HAS UNIT DIGIT 8
C. NOTICE AND TENS DIGIT = 4
P.O.E.

54. One of the following graphs in the standard (x,y) coordinate plane is the graph of $y = \sin^2 x + \cos^2 x$ over the domain $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$. Which one?



A. TRIG PYTHAGORAS RULE
 $y = \sin^2 x + \cos^2 x = 1$
 SO $y = 1$

55. What is the period of the function $f(x) = \csc(4x)$?

- A. π
- B. 2π
- C. 4π
- D. $\frac{\pi}{4}$
- E. $\frac{\pi}{2}$

A. REMEMBER
 $\csc(x) = 2\pi$
B. THE $(4x)$ MEANS THE IMAGE WILL COMPRESS BY 4
C. FIGURE ANSWER
 $\frac{2\pi}{4} = \frac{\pi}{2}$

SLICK! GET FAMILIAR

56. At the school carnival, Mike will play a game in which he will toss a penny, a nickel, and a dime at the same time. He will be awarded 3 points for each coin that lands with heads faceup. Let the random variable x represent the total number of points awarded on any toss of the coins. What is the expected value of x ?

- F. 1
- G. $\frac{3}{2}$
- H. $\frac{9}{2}$
- J. 6
- K. 9

A. ADD UP EACH (PROB)(PTS)
 $\frac{1}{2}(3) + \frac{1}{2}(3) + \frac{1}{2}(3)$
 $\frac{3}{2} + \frac{3}{2} + \frac{3}{2}$
 $\frac{9}{2}$

57. For what positive real value of k , if any, is the determinant of the matrix $\begin{bmatrix} k & 4 \\ 3 & k \end{bmatrix}$ equal to k ?

- A. 3
- B. 4
- C. 12
- D. $\sqrt{12}$
- E. There is no such value of k .

A. FOLLOW RECIPE
 (Note: The determinant of matrix $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ equals $ad - bc$.)
B. PLUG IN ANSWERS
 $k^2 - 12 = k$
 $4^2 - 12 = 4$
 $16 - 12 = 4$
A MATCH!
OR $k^2 - k - 12 = 0$
 $(k-4)(k+3)$
 $k-4=0$
 $k=4$

58. Given a positive integer n such that $i^n = 1$, which of the following statements about n must be true?

- F. When n is divided by 4, the remainder is 0.
- G. When n is divided by 4, the remainder is 1.
- H. When n is divided by 4, the remainder is 2.
- J. When n is divided by 4, the remainder is 3.
- K. Cannot be determined from the given information.

A. i RULES
 $i^1 = i$
 $i^2 = -1$
 $i^4 = 1$
 $i^8 = 1$
 $i^{12} = 1$
 SO $n \div 4$ HAS NO REMAINDER

59. For $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$, $|\sin \theta| \geq 1$ is true for all and only the values of θ in which of the following sets?

- A. $[-\frac{\pi}{2}, \frac{\pi}{2}]$
- B. $[\frac{\pi}{2}]$
- C. $\{\theta \mid -\frac{\pi}{2} < \theta < \frac{\pi}{2}\}$
- D. $\{\theta \mid -\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}\}$
- E. The empty set

A. REMEMBER: UNIT SIN $\theta = \pm 1$ AND CIRCLE
B. SIN IS THE Y-VALUE
C. SO = 1 AT 90° AND 270°
D. WHAT'S THE VALUE OF BOTH?
 $90 = \frac{\pi}{2}$ $270 = \frac{3\pi}{2}$ OR $-\frac{\pi}{2}$

60. Ray \overrightarrow{PK} bisects $\angle LPM$, the measure of $\angle LPM$ is $11x^\circ$, and the measure of $\angle LPK$ is $(4x + 18)^\circ$. What is the measure of $\angle KPM$?

- F. 12°
- G. $28\frac{2}{3}^\circ$
- H. 42°
- J. $61\frac{1}{3}^\circ$
- K. 66°

A. DRAW IT

B. SET EQUALITY
 $\angle LPM = 2 \angle LPK$
 $11x = 2(4x + 18)$
 $11x = 8x + 36$
 $3x = 36$
 $x = 12$
C. SOLVE FOR X
D. PLUG IN X FOR $\angle LPK$
 $4x + 18$
 $4(12) + 18$
 $48 + 18$
 66

#	MATH	1	C	41	A
2	K	42	G		
3	B	43	C		
4	J	44	F		
5	D	45	A		
6	H	46	J		
7	D	47	B		
8	G	48	G		
9	D	49	B		
10	G	50	J		
11	D	51	C		
12	H	52	F		
13	B	53	A		
14	H	54	H		
15	D	55	E		
16	K	56	H		
17	B	57	B		
18	K	58	F		
19	B	59	A		
20	K	60	K		
21	B				
22	F				
23	C				
24	J				
25	A				
26	H				
27	A				
28	H				
29	E				
30	J				
31	E				
32	G				
33	E				
34	H				
35	C				
36	J				
37	A				
38	K				
39	D				
40	K				