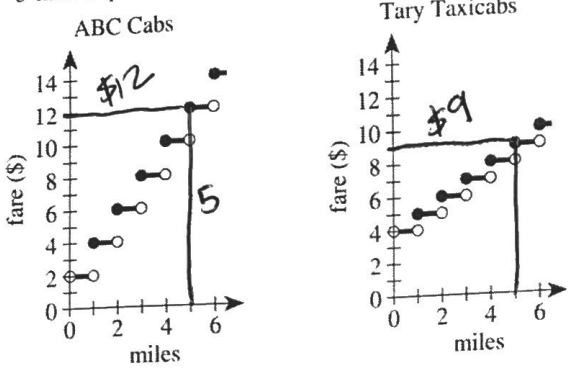
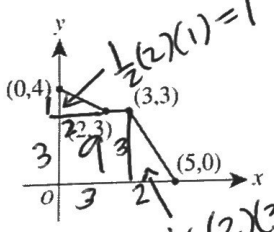
2

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

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?



$\frac{1}{2}(2)(1)=1$

$\frac{1}{2}(2)(3)=3$

$9+1+3=13$

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

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

(50) $x+y=151$ x = greater #, y = lesser #

$y=\sqrt{x}+19$

Substitute to solve the system

$x+\sqrt{x}+19=151$

$-151 \quad -151$

$x+\sqrt{x}-132=0$ Rewrite and Solve Quadratic Form $(\sqrt{x})^2=x$

$(\sqrt{x})^2+(\sqrt{x})-132=0$ Factor

$(\sqrt{x}+12)(\sqrt{x}-11)=0$

$\sqrt{x}+12=0$ $\quad \sqrt{x}-11=0$

$-12 \quad -12$ $\quad +11 \quad +11$

$\sqrt{x}=-12$ $\quad \sqrt{x}=11$ Square both sides

No solution so try the next one $\quad (\sqrt{x})^2=11^2$

$x=121$

Now find y

$x+y=151$

$121+y=151$

$-121 \quad -121$

$y=30$

The question asks what the value of the greater minus the lesser. So $x-y$

$121-30=91$

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

52. You are given the following system of equations:

$$y = x^2$$
$$rx + sy = t$$

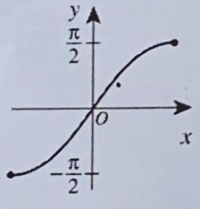
where r, s, and t are integers. For which of the following will there be more than one (x,y) solution, with real-number coordinates, for the system?

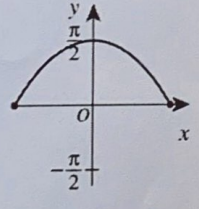
F. $r^2 + 4st > 0$
G. $s^2 - 4rt > 0$
H. $r^2 - 4st < 0$
J. $s^2 - 4rt < 0$
K. $s^2 + 4rt < 0$

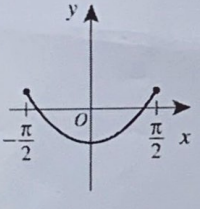
53. The 3rd and 4th terms of an arithmetic sequence are 13 and 18, respectively. What is the 50th term of the sequence?

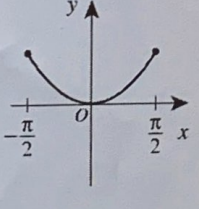
A. 248
B. 250
C. 253
D. 258
E. 263

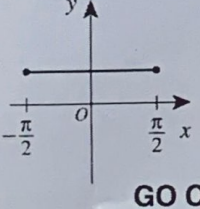
54. One of the following graphs in the standard (x,y) coordinate plane is the graph of $y = \sin^2 x + \cos^2 x$ over the domain $-\frac{\pi}{2} \le x \le \frac{\pi}{2}$. Which one?

F.


J.


G.


K.


H.


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(51) Y is 15 bc its the mode.

41, 35, 30, X, 15, 15

~~median~~ = 25

$\frac{30+X}{2} = 25 \cdot 2$

$30 + X = 50$

$-30 \quad -30$

$X = 20$

mean

$41+35+30+20+15+15 = 156/6 = 26$

(52) $y = x^2 \rightarrow rx + s(x^2) = t$

Write in standard form $sx^2 + rx - t = 0$

$a = s \quad b = r \quad c = -t$

Discriminant for more than one Real solution

$b^2 - 4ac > 0$

$r^2 - 4(s)(-t) > 0$

$r^2 + 4st > 0$

(53) $\_\_ \quad \_\_ \quad 13, \quad 18$

$\frac{3}{a_1}, \quad \frac{8}{}, \quad \frac{13}{}^{+5}, \quad 18$

$a_{50} = a_1 + (n-1)d$

$a_1 = 3$

$d = 5$

$n = 50$

$a_{50} = 3 + (50-1)5$

$a_{50} = 248$

(54) $y = \sin^2 X + \cos^2 X$

Trig Identity

$\sin^2 X + \cos^2 X = 1$

So $y = 1$ which is graph H.