1. If $f(x) = 7x^2 - 2x + 1$, then what is the value of $f(2) + f(5)$ ?

2. What the expression for A, below?

$$\frac{2}{x} + \frac{3}{y} + \frac{5}{xy} = \frac{A}{xy}$$

**(A)** $2x + 3y + 5xy$

**(B)** $2y + 3x + 5$

**(C)** $2x + 2y + 5$

**(D)** $10xy$

3. Anise needs to complete a printing job using both of the printers in her office. One of the printers is twice as fast as the other, and together the printers can complete the job in 5 hours. The equation below represents the situation described.

$$\frac{1}{x} + \frac{2}{x} = \frac{1}{5}$$

Which of the following describes what the expression $\frac{1}{x}$ represents in this equation?

**A)** The time, in hours, that it takes the slower printer to complete the printing job alone.

**B)** The portion of the job that the slower printer would complete in one hour.

**C)** The portion of the job that the faster printer would complete in two hours.

**D)** The time, in hours, that is takes the slower printer to complete $\frac{1}{5}$ of the printing job.

4. If $x^2 + ax + b = (x - 9)(x + 9)$ what is the value of $ab$?

**(A)** -81

**(B)** 0

**(C)** 81

**(D)** 9

5. In the equation below, the angle measures are in radians and $K$ is a constant. Which of the following could be the value of $K$?

$$\sin(x) = \cos(K - x)$$

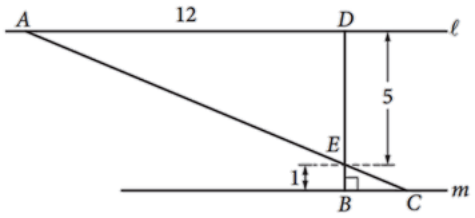
**A)** 0

**B)** $\frac{\pi}{4}$

**C)** $\frac{\pi}{2}$

**D)** $\pi$

6. If $h(x) = 3x + 5$ and $h(y) = 27$, then what is the value of $y$?




7. In the figure above, line $l$ is parallel to line $m$, segment BD is perpendicular to line $m$, and segment AC and segment BD intersect at E. What is the length of segment AC?

8. A bank has opened a new branch and, as part of a promotion, the bank branch is offering \$1,000 certificates of deposit at an interest rate of 4% per year, compounded semiannually. The bank is selling certificates with terms of 1, 2, 3, or 4 years. Which of the following functions gives the total amount, $A$, in dollars, a customer will receive when a certificate with a term of $k$ years is finally paid?

**A)** $A = 1,000(1 + 0.04k)$

**B)** $A = 1,000(1 + 0.08k)$

**C)** $A = 1,000(1.04)^k$

**D)** $A = 1,000(1.02)^{2k}$

9. Let $f(x) = 4x - 3$. If $f(a) = 9$ and $f(b) = 5$, then what is $f(a + b)$?

**(A)** 5
**(B)** 7
**(C)** 14
**(D)** 16
**(E)** 17

10. If $a^2 + 14a = 51$ and $a > 0$, what is the value of $a + 7$?

11. If a right triangle $\triangle XYZ$ has a hypotenuse with length $5t$ and a leg with length $4t$ and the perimeter $\triangle XYZ$ is 72, then what is the value of $x$?

12. If $f(x) = x^2 - 1$ and $f(2a) = 35$, then what is the value of $a$?

**(A)** -6
**(B)** -3
**(C)** 1
**(D)** 2
**(E)** 6

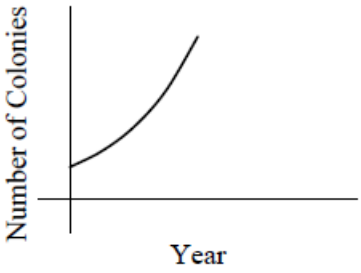
13. If a sector of a circle with an angle of $\frac{\pi}{3}$ has an area of $24\pi$, what is the radius of the circle?

**(A)** 72
**(B)** 24
**(C)** 12
**(D)** 8

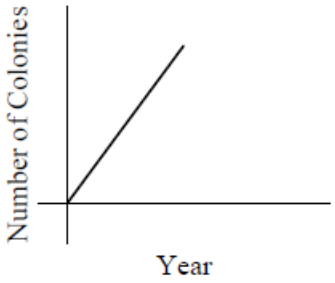
| Year | Number of Colonies |
|---|---|
| 1992 | 41,402 |
| 1993 | 43,783 |
| 1994 | 46,194 |
| 1995 | 48,545 |

14. The table above shows the number of fire ant colonies found in Greenville from 1992 to 1995. Which of the collowing graphs best represents the number of fire ant colonies in Greenville?

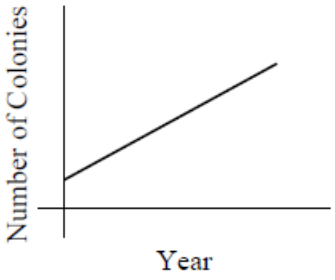
(A)



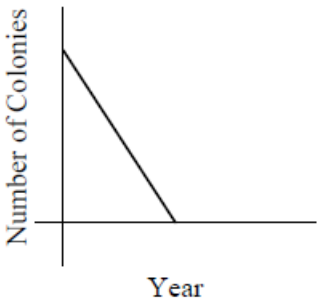

(B)




(C)




(D)



15. Which of the following is equal to $\frac{1+i}{1-i}$?

**A)** $i$

**B)** $2i$

**C)** $-1+i$

**D)** $1+i$

16. If $f(x) = 2x^2 + 1$, then what is the value of $f(4) + f(6)$?

**(A)** $f(8)$

**(B)** $f(10)$

**(C)** $f(12)$

**(D)** $f(18)$

**(E)** $f(28)$

17. The function $s$ is defined to be

$$s(t) = 5t + \frac{2}{3}.$$

If for some number $v$, $s(v + \frac{1}{6}) = \frac{5}{6}$, then what is $v$?

18. For the function $f$ graphed on the $xy$-plane above, if $f(-2.5) = k$, then what is $f(2k)$?

19. If $f(x)$ is a linear function that passes through the points $(4, 3)$ and $(-4, -9)$, what is the value of the $y$-intercept of $f(x)$?

**(A)** 2

**(B)** 0

**(C)** -3

**(D)** 4

20. You have a bag of green and blue marbles. The ratio of green marbles to blue marbles is 4 to 3. When 5 green marbles are removed and 5 blue marbles are removed, the ratio becomes 3 to 2. How many green marbles were orginally in the bag?

**(A)** 12

**(B)** 15

**(C)** 18

**(D)** 24

21. What is one possible solution to the equation $\frac{24}{x+1} - \frac{12}{x-1} = 1$?

22. If $p$ is a prime number, how many factors does $p^3$ have?

**(A)** One

**(B)** Two

**(C)** Three

**(D)** Four

23. A furniture store buys its furniture from a wholesaler. For a particular table, the store usually charges its cost from the wholesaler plus 75%. During a sale, the store charged the wholesale cost plus 15%. If the sale price of the table was \$299, what is the usual price for the table?

**A)** \$359

**B)** \$455

**C)** \$479

**D)** \$524

24. How many integers between 10 and 500 begin and end in 3?

25. $x^2 + 8x + y^2 - 6y = 24$
The graph of the equation above in the $xy$-plane is a circle. What is the radius of the circle

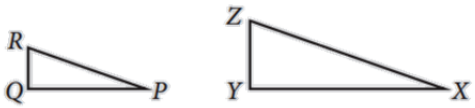
26. A particular integer $N$ is divisible by two difference prime numbers $p$ and $q$. Which of the following must be true?

***I. N is not a prime number.***

***II. N is divisible by pq.***

***III. N is an odd integer.***

**(A)** I only.
**(B)** II only
**(C)** I and II only
**(D)** I, II, and III




27. In the figure above, right triangle $PQR$ is similar to right triangle $XYZ$, with vertices $P$, $Q$, and $R$ corresponding to vertices $X$, $Y$, and $Z$, respectively. If $\cos R = 0.263$ what is the value of $\cos Z$?

28. If $x$ must be an even integer, how many possible values of $x$ must satisfy $\sqrt{x+7} \leq 3$?

**(A)** One
**(B)** Two
**(C)** Three
**(D)** Four

29. Let $y = \frac{x+2}{x-5}$ for any $x$, where $x \neq 1$. Which of the following is equivalent $y - 5$?

**(A)** $\frac{x-3}{x-5}$
**(B)** $\frac{-4(x+5)}{x-5}$
**(C)** $\frac{x+7}{x-5}$
**(D)** $\frac{-4x+30}{x-5}$

30. A voter registration drive was held in Town Y. The number of voters, $V$, registered $T$ days after the drive began can be estimated by the equation $V = 3{,}450 + 65T$. What is the best interpretation of the number 65 in this equation?

**A)** The number of registered voters at the beginning of the registration drive
**B)** The number of registered voters at the end of the registration drive
**C)** The total number of voters registered during the drive
**D)** The number of voters registered each day during the drive

31. If $x$ and $y$ are numbers such that $(x - 5)(y + 8) = 0$, then what is the smallest possible value of $x^2 + y^2$?

32. Which line is perpendicular to $y = 6 - 2x$?

**(A)** $y = -2x + 1$
**B)** $y = -\frac{1}{2}x + 2$
**C)** $y = \frac{1}{2}x + 3$
**D)** $y = 2x + 4$

33. If $f(x) = ax^2$ and $g(x) = bx^3$for any value of $x$ and any positive integers $a$ and $b$, how many values of $x$ is $f(x) = g(x)$?

**(A)** None
**(B)** One
**(C)** Two
**(D)** Three

Use the following for questions **34-35**.

A chemist mixing a solution of cobalt (II) chloride to a very specific concentration. To test the accuracy of the solution concentration, the chemist evaluates the absorbance of samples from several different trials using spectrophotometry. His results are given in the table below.

| Trial Number | Absorbance |
|---|---|
| 1 | 0.7321 |
| 2 | 0.7364 |
| 3 | 0.7342 |
| 4 | 0.7330 |
| 5 | 0.7283 |

The concentration $C$ is related to the absorbance $A$, via the equation

$$A = 4.86C + 0.0038$$

34. What is the average abosorbance of the samples tested?

**(A)** 0.7330

**(B)** 0.7338

**(C)** 0.7328

**(D)** 0.7317

35. What does the 4.86 and 0.0038 in the equation mean in this experiment?

36. On Thursday, 240 adults and children attended a show. The ratio of adults to children was 5 to 1. How many children attended the show?

**A)** 40

**B)** 48

**C)** 192

**D)** 200

37. If $f(x) = 4x - 3$ and $f(v + 4) = 5$, what is the value of $v$?

**(A)** -2

**(B)** -1

**(C)** 1

**(D)** 4

38. A paper shreder can shred paper at a rate of 5 pages per minute. How many hours will it take to shred 300 pages?

**(A)** 0.5

**(B)** 1

**(C)** 1.5

**(D)** 3

39. Let $a$ and $b$ be numbers such that $a^7 = b^2$. Which of the following is equivalent to $b\sqrt{a}$?

**(A)** $b^{\frac{2}{7}}$

**(B)** $b^{\frac{8}{7}}$

**(C)** $b^7$

**(D)** $b^9$

40. Scientists estimate that the Pacific Plate, one of Earth's tectonic plates, has moved about 1,060 kilometers in the past 10.3 million years. What was the average speed of the Pacific Plate during that time period, in centimeters per year?

**A)** 1.03

**B)** 10.3

**C)** 103

**D)** 1,030

41. Let $a$ and $b$ be integers such that $a > b$ and

$$\sqrt{108} + \sqrt{108} = a\sqrt{b}.$$

Answer the following.

**I)** What is the value of $a$?

**II)** What is the value of $b$?

42. If the expression $\frac{4x^2}{2x-1}$ is written in the equivalent for $\frac{1}{2x-1} + A$, what is A in terms of $x$?

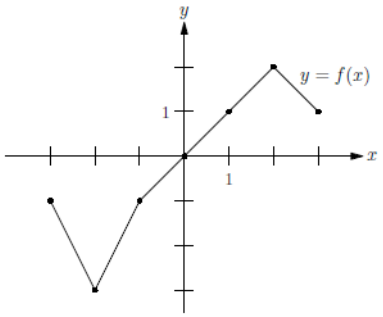
**A)** $2x + 1$
**B)** $2x - 1$
**C)** $4x^2$
**D)** $4x^2 - 1$

43.

| $t$ | 0 | 1 | 2 |
|---|---|---|---|
| $N(t)$ | 256 | 64 | 16 |

The table above shows some of the values for the function $N$. If $N(t) = k \cdot 2^{-at}$ for positive constants $k$ and $a$, what is the value of $a$?

44. Cindy is two years older than Christian. The square of Christian's age in years 36, which is greater than the square of Christian's age in years. What is the sume of Cindy's age and Christian's age in years?




45. The function $f$ is graphed above. If the function $g$ is defined to be $g(x) = f(-x)$, then what is the value of $x$ does $g$ attain its maximum value?

**(A)** -3
**(B)** -2
**(C)** 3
**(D)** 2

46.

$$3s - 2t = a$$
$$-15s + bt = -7$$

In the system of equations above, $a$ and $b$ are constants. If the system of equations has infinitely many solutions, what is the value of $a$?

47. If $(x + 1)^2 - 4$ and $(x - 1)^2 = 16$, what is the value of $x$?

48. The curve $y = \frac{1}{2}x^2$ and the line $y = \frac{1}{2}x$ intersect at the origin and at the point $(a, b)$. What is the value of $b$?

**(A)** $\frac{1}{8}$
**(B)** $\frac{1}{4}$
**(C)** $\frac{1}{2}$
**(D)** 1

49. A triangle $\triangle ABC$ has $\overline{AB} = 6$, $\overline{BC} = 8$ and $\angle ABC = 60°$. What is the area of the triangle?

**(A)** $12\sqrt{2}$
**(B)** $12\sqrt{3}$
**(C)** $24\sqrt{2}$
**(D)** $24\sqrt{3}$

50. Line $l$ goes through points $P$ and $Q$, which coordinates are $(0, 1)$ and $(b, 0)$ respectively. If the slope of line $l$ is greater than $-\frac{1}{2}$, then which of the following could be the value of $b$?

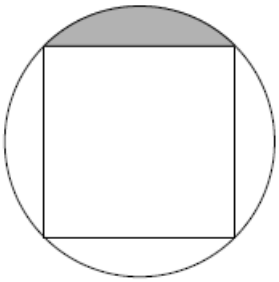
**(A)** $\frac{5}{2}$
**(B)** $\frac{3}{2}$
**(C)** 1
**(D)** $\frac{1}{2}$

51. If triangle $\triangle ABC$ has $\overline{AC} = 7$ and $\overline{AB} = \overline{BC}$, then what is the smallest possible value of $m\overline{AB}$?

52. $x^2 + (y+1)^2 = 4$
The graph of the equation above in the $xy$-plane is a circle. If the center of this circle is translated 1 unit up and the radius of the circle increased by 1, which of the following is an equation of the resulting circle?

**A)** $x^2 + y^2 = 5$
**B)** $x^2 + y^2 = 6$
**C)** $x^2 + (y+2)^2 = 5$
**D)** $x^2 + (y+2)^2 = 6$

53. The perimeter of a particular equilateral triangle is numerically equal to the area of the triangle. What is the perimeter of the triangle?

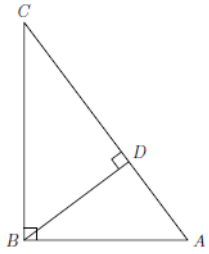


54. In the figure above, a square is inscribed in a circle. If the area of the square is 256 squared inches, what is the perimeter of the shaded region?

**(A)** $256 + 16\pi\sqrt{2}$
**(B)** $4\pi\sqrt{2} + 16$
**(C)** $4\pi\sqrt{2} + 16\pi\sqrt{2}$
**(D)** $512 + 4\pi\sqrt{2}$

55. If $4n(n+8) = 36$, what is the product of the two solutions to this equation?

**(A)** -12
**(B)** -9
**(C)** 0
**(D)** 9




56. In the figure above, $\overline{AB} = 10$ and $\overline{BC} = 15$. What is the length of $\overline{BD}$?

| Time (hours) | Number of bacteria |
|---|---|
| 0 | $1 \times 10^3$ |
| 1 | $4 \times 10^3$ |
| 2 | $1.6 \times 10^4$ |
| 3 | $6.4 \times 10^4$ |

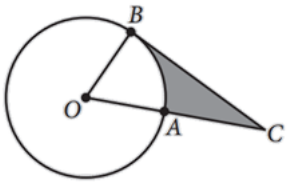
57. The table above gives the initial number (at time $t = 0$) of bacteria placed in a growth medium and the number of bacteria in the growth medium over 3 hours. Which of the following functions models the number of bacteria, $N(t)$, after $t$ hours?

**A)** $N(t) = 4,000t$
**B)** $N(t) = 1,000 + 3,000t$
**C)** $N(t) = 1,000(4^{-t})$
**D)** $N(t) = 1,000(4^t)$

58. A triangle $\triangle ABC$ on the $xy$-plane in quadrant I has its vertices at $A(0,0)$, $B(2,a)$, and $C(10,0)$. If $\angle ABC$ is a right angle, then what is the value of $a$?

**(A)** $2\sqrt{2}$
**(B)** 4
**(C)** 5
**(D)** $5\sqrt{2}$

59. The arithmetic mean of a particular set of seven numbers is 12. When one of the numbers is replaced by the number 6, the average of the set increases to 15. What is the number that was replaced?




60. In the figure above, $O$ is the center of the circle, segment $BC$ is tangent to the circle at $B$, and A lies on the segment $OC$. If $OB = AC = 6$, what is the area of the shaded region?

**A)** $18\sqrt{3} - 3\pi$

**B)** $18\sqrt{3} - 6\pi$

**C)** $36\sqrt{3} - 3\pi$

**D)** $36\sqrt{3} - 6\pi$

61. To edit a manuscript, Miguel charges \$50 for the first 2 hours and \$20 per hour after the first 2 hours. Which of the following expresses the amount in dollars, $C$, Miguel charges if it takes him $x$ hours to edit a manuscript, where $x \geq 2$?

**A)** $C = 20x$

**B)** $C = 20x + 10$

**C)** $C = 20x + 50$

**D)** $C = 20x + 90$

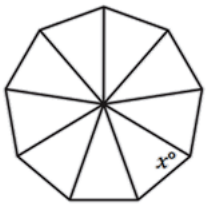
62. Let $a$, $b$, and $c$ be positive integers. If the arithmetic mean of $a$, $b$, and $c$ is 100, which of the following is NOT a possible value of any of the integers?

**(A)** 1

**(B)** 100

**(C)** 299

**(D)** 298




63. In the figure above, a regular polygon with 9 sides has been divided into 9 congruent isosceles triangles by line segments drawn from the center of the polygon to its vertices. What is the value of x?

$$3(\frac{1}{2} - y) = \frac{3}{5} + 15y$$

64. What is the solution to the equation above?

65. A community center offers a Spanish course. This year, all students in the course were offered additional audio lessons they could take at home. The students who took these additional audio lessons did better in the course than students who didn't take the additional audio lessons. Which of the following is an appropriate conclusion?

**A)** Taking additional audio lessons will cause an improvement for any student who takes any foreign language course.

**B)** Taking additional audio lessons will cause an improvement for any student who takes a Spanish course.

**C)** Taking additional audio lessons was the cause of the improvement for the students at the community center who took the Spanish course.

**D)** No conclusion about cause and effect can be made regarding students at the community center who took the additional audio lessons at home and their performance in the Spanish course.

66. Maizah bought a pair of pants and a briefcase at a department store. The sum of the prices before sales tax was \$130.00. There was no sales tax on the pants and a 9% sales tax on the briefcase. The total Maizah paid, including the sales tax, was \$136.75. What was the price, in dollars, of the pants?

67. $\begin{cases} x^2 + y^2 = 153 \\ y = -4x \end{cases}$

If $(x, y)$ is a solution to the system of equations above, what is the value of $x^2$?

**A)** -51
**B)** 3
**C)** 9
**D)** 144

68. A store is deciding whether to install a new security system to prevent shoplifting. The security manager of the store estimates that 10,000 customers enter the store each week, 24 of whom will attempt to shoplift. The manager estimates the results of the new security system in detecting shoplifters would be as shown in the table below.

| Shoplifting | Sounds | No Sound | Total |
|---|---|---|---|
| Attempts | 21 | 3 | 24 |
| Doesn't attempt | 35 | 9,941 | 9,976 |
| Total | 56 | 9,944 | 10,000 |

According to the manager's estimates, if the alarm sounds for a customer, what is the probability that the customer did not attempt to shoplift?

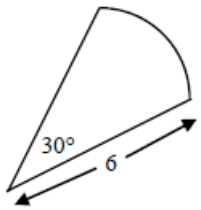
**A)** 0.03%
**B)** 0.35%
**C)** 0.56%
**D)** 62.5%

69. If $r = 5.5$, what is the value of $|r| - |1 - r|$?

**(A)** 1.5
**(B)** 1
**(C)** 5.5
**(D)** 9.5

70. If $(3x + 2)(5x + 1) = ax^2 + bx + 2$, what is the value of $a - b$?

**(A)** 2
**(B)** 8
**(C)** 22
**(D)** 28




71. The radius of the circle that is sector is a part of is 6 and this sector has an angle of 30°, answer the following:

**I.** What is the arc length of this sector?

**(A)** 180
**(B)** 90
**(C)** $\pi$
**(D)** $2\pi$

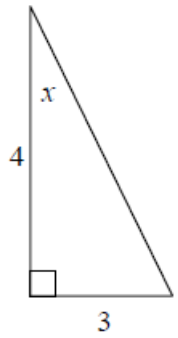
**II.** What is the area of this sector?

72. If $x^2 = 0.1$, what is the value of $x^{-4}$?

**(A)** 1
**(B)** 10
**(C)** 100
**(D)** 1000

73. What is the value of $n$ that satisfies the equation below?

$$\frac{n^2+1}{-2n+8} = -13$$



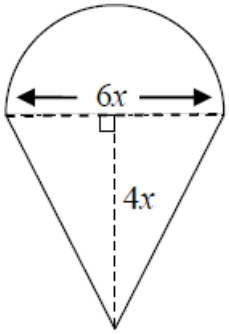

74. If $(0,4)$ is a point on a linear function $g(x)$ and $f(x) = 2x - 1$ is perpendicular to $g(x)$. At what point do $f(x)$ and $g(x)$ intersect?

**(A)** $(0,-1)$

**(B)** $(1,1)$

**(C)** $(2,3)$

**(D)** $(3,2)$




75. What is the perimeter of the figure above, in terms of $x$?

**(A)** $5x + 3\pi x$

**(B)** $5x + 6\pi x$

**(C)** $10x + 3\pi x$

**(D)** $10x + 6\pi x$

76. If $5^{x+4} = 25^{x+3}$, what is the value of $x$?

**(A)** -2

**(B)** -1

**(C)** 0

**(D)** 1

77. If the figure above, find the following:

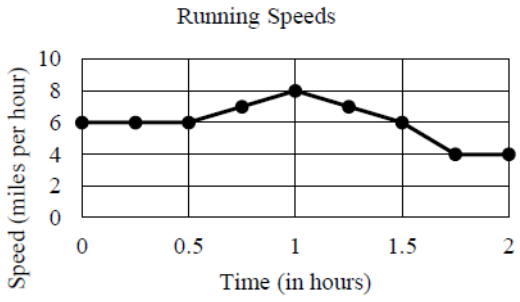
**I.** $\sin(x)$

**II.** $\tan(x)$

**III.** $\sin^2(x) + \cos^2(x)$
*Hint: it shouldn't be hard* ☺

78. In the equation below, what is the value of $A+B$?

$$\frac{5}{x^2+6x+8} = \frac{A}{x+2} + \frac{B}{x+4}$$




79. The graph above shows Herman's running speeds during a two hour run. What is the total distance, in miles, that Herman ran during the first hour of his run?

80. If $2i - \frac{2-3i}{5+i} = a + bi$, what is $ab$?

Use the following to answer questions **81-82**.

Newton's law of gravitational force denotes that two objects exert equal and opposite attractive gravitational forces on each other. The equation is as follows:

$$F_G = G\frac{m_1 m_2}{r^2}$$

where $F_G$ is the gravitational force, $m_1$is the mass of the first object in kilograms, $m_2$is the mas of the second object in kilograms, $r$ is the distance between the centers of the two objects in meters and $G$ is the gravitational constant, which is equal to $6.7 \times 10^{-11}\frac{N \cdot m^2}{kg^2}$

81. What is $m_2$ in terms of the other variables?

**(A)** $m_2 = F_G \cdot G\frac{m_1}{r^2}$

**(B)** $m_2 = \frac{F_G \cdot r^2}{G \cdot m_1}$

**(C)** $m_2 = \frac{G \cdot F_G}{r^2}$

**(D)** $m_2 = G \cdot F_G \cdot m_1$

82. If two objects experience a gravitational force of $F$ when they are distance $r$ away from each other, what is the new gravitational force $F'$ experienced by the objects if the mass of the second object is doubled and the distance between them is halved in terms of $F$?

**(A)** $F' = \frac{1}{4}F$

**(B)** $F' = \frac{1}{16}F$

**(C)** $F' = F$

**(D)** $F' = 8\text{F}$

83. At your local no-kill animal shelter, $\frac{1}{3}$ of the pets available for adoption are cats, and of those cats, $\frac{2}{5}$ are kittens; the rest are adult cats. Half of the cats at the shelter have green eyes, and a third of them are declawed. If someone adopts a pet at random from this shelter, what are the odds that they will adopt an adult cat with green eyes that has not been declawed?

**(A)** $\frac{1}{45}$

**(B)** $\frac{1}{30}$

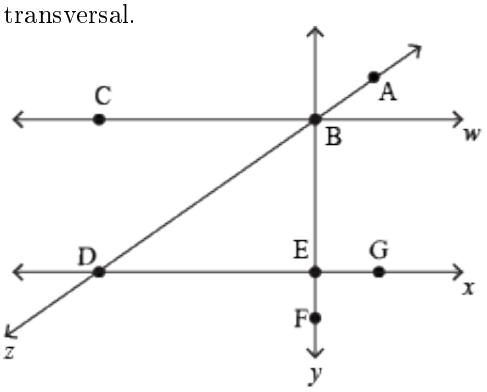
**(C)** $\frac{1}{25}$

**(D)** $\frac{1}{20}$

84. A recipe calls for 2 cups of flour, 4 tablespoons of baking soda, 12 ounces of sugar, and 1 cup of water. If there are 16 tablespoons in a cup and 2 tablespoons per ounce, how many tablespoons of dry (including sugar) ingredients does the recipe call for?

85. The function $f(x) = x^2 - kx + 3$ intersects the function $g(x) = -kx + m$ at the point $(-1, 6)$. What is the value of $\frac{k}{m}$?

Use the following figure to answer questions **86-87**.
Suppose line $w$ and $x$ are parallel with line $y$ perpendicular to both line $w$ and $x$ and line $z$ a transversal.




86. If $\triangle BED$ is a triangle that is similar to $\triangle FEG$, $\overline{BE} = 7$, $\overline{FG} = 6$, and $\overline{EF} = 2$, then what is the area of $\triangle BED$?

87. If $m\angle ABE = 137°$, then what is the measure of $\angle BDE$ in degrees?

**(A)** 137
**(B)** 133
**(C)** 47
**(D)** 43

88. If $\frac{2}{a-1} = \frac{4}{y}$, $y \neq 0$ and $a \neq 1$, what is $y$ in terms of $a$?

**(A)** $y = 2a - 2$
**(B)** $y = 2a - 4$
**(C)** $y = 2a - \frac{1}{2}$
**(D)** $y = \frac{1}{2}a + 1$

89. Which of the following is equal to $(14 - 2i)(7 + 12i)$?

**(A)** 74
**(B)** 122
**(C)** $74 + 154i$
**(D)** $122 + 154i$

90. If $a^{-\frac{1}{2}}$, where $a > 0$ and $x > 0$, which of the following equations gives $a$ in terms of $x$?

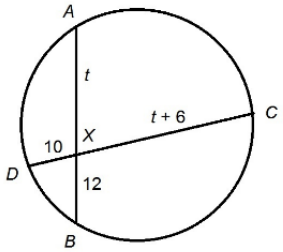
**(A)** $a = \frac{1}{\sqrt{x}}$
**(B)** $a = \frac{1}{x^2}$
**(C)** $a = \sqrt{x}$
**(D)** $a = -x^2$

91. A bank in India sells a prepaid credit card worth 7500 rupees. Mandy can buy the prepaid card using dollars at the daily exchange rate with no fee, but she will lose any money left unspent on the prepaid card. What is the least number of the 7500 rupees on the prepaid card Mandy must spend for the prepaid card to be cheaper than charging all her purchases on the Traveler card? Round your answer to the nearest whole number of rupees.

92. If $\frac{1}{2}x + \frac{1}{3}y = 4$, what is the value of $3x + 2y$?

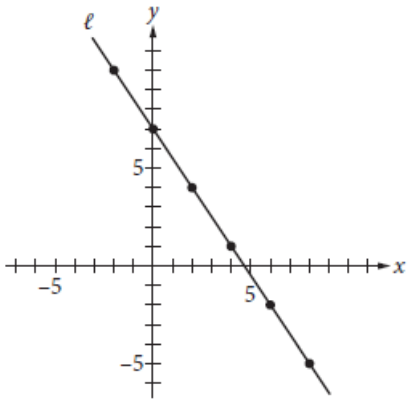
93. Which of the followin is equal to $\sin(\frac{\pi}{5})$?

**(A)** $-\cos(\frac{\pi}{5})$
**(B)** $-\sin(\frac{\pi}{5})$
**(C)** $\cos(\frac{3\pi}{10})$
**(D)** $\sin(\frac{7\pi}{10})$



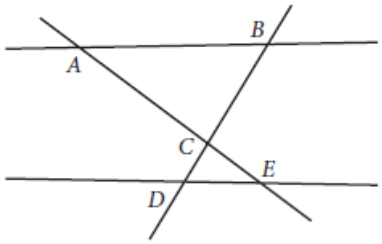

94. What the value of $t$?

**(A)** 30
**(B)** 36
**(C)** 40
**(D)** 41




95. Line $l$ is graphed in the $xy$-plane above. If line $l$ is translated 5 units up and 7 units to the right, then what is the slope of the new line?

**(A)** $-\frac{2}{5}$
**(B)** $-\frac{3}{2}$
**(C)** $-\frac{8}{9}$
**(D)** $-\frac{11}{14}$




96. In the figure above, $\triangle ABC$ is similar to $\triangle EDC$. Which of the following must be true?

**(A)** $\overline{AE} \parallel \overline{BD}$
**(B)** $\overline{AE} \perp \overline{BD}$
**(C)** $\overline{AB} \parallel \overline{DE}$
**(D)** $\overline{AB} \perp \overline{DE}$

97. At a primate reserve, the mean age of all the male primates is 15 years, and the mean age of all female primates is 19 years. Which of the following must be true about the mean age $m$ of the combined group of male and female primates at the primate reserve?

**(A)** $m = 17$
**(B)** $m > 17$
**(C)** $m < 17$
**(D)** $15 < m < 19$

98. If $4n^2 - 1 = 16m^2 - 1$, then what is the value of $n$ in terms of $m$?

**(A)** $m$
**(B)** $2m$
**(C)** $m^2$
**(D)** $4m$

99. The width of a rectangular solid is twice the height of the solid, and the height of the solid is twice the length of the solid. If $x$ is the length of the solid, what is the surface area of the solid in terms of $x$?

**(A)** $8x^2$
**(B)** $14x^2$
**(C)** $20x^2$
**(D)** $28x^2$

*Solution guide, soon to come...*