1. The price of green tea leaves is D dollars for 5 ounces and each ounce makes x bottles of green tea drink. In terms of D and x, which of the following expressions shows the cost of making 1 bottle of green tea drink?
   a) $5Dx$
   b) $\frac{5D}{x}$
   c) $\frac{5x}{D}$
   d) $\frac{D}{5x}$

2. The table below gives values of the quadratic function $f(x)$ at selected values of x. Which of the following defines $f(x)$?

x	0	1	2	3
$f(x)$	5	7	13	23

   a) $f(x) = x^2 + 5$
   b) $f(x) = x^2 + 1$
   c) $f(x) = 2x^2 - 5$
   d) $f(x) = 2x^2 + 5$

3. If If $\frac{x}{2} = 0$, what is the value of $1 + x + 2x^2 + 3x^3 =$?
   a) 2
   b) 1
   c) 0
   d) 3

4. If $\frac{x}{3} = \frac{3x}{z}$ and $z \neq 0$, what is the value of z ?
   a) 9
   b) 6
   c) 4
   d) 3

5. The equation of line line m is $x - 2y = 3$. Which of the following is an equation of the line that is perpendicular to line m?
   a) $y = x - 2$
   b) $y = -x + 2$
   c) $y = 2x - 1$
   d) $y = -2x + 1$

6. If a linear function passes through the points (1, s), (3, t) and (5, 10), what is the value of $2t - s$?
   a) 2
   b) 4
   c) 8
   d) 10

7. If $x < 5 < \frac{1}{x-1}$, then x could be which of the following?
   a) 5
   b) 1
   c) $\frac{7}{6}$
   d) $\frac{10}{3}$

8. If $|5 - 2x| < 3$, which of the following is a possible value of x ?
   a) 3
   b) 5
   c) 6
   d) 1

9. If $x = -\frac{1}{2}$, what is the value of $\frac{1}{x} - \frac{1}{x+1}$?
   a) -4
   b) -2
   c) 2
   d) 4

10. You spend $\frac{2}{5}$ of your paycheck on rent, then $\frac{1}{3}$ of what's left on food. If your paycheck is \$600, how much money remains after both expenses?
    a) \$152
    b) \$240
    c) \$350
    d) \$420

11. If $x^2 - y^2 = 15$, and $x - y = 3$, what is the value of $x + y$?
    a) 1
    b) 3
    c) 5
    d) 10

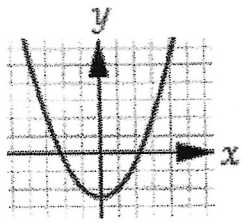
12. Factor out the simplest form: $2x^2 - 8x$
    a) $(x - 4)(x + 2)$
    b) $2x(x - 4)$
    c) $x(2x - 8)$
    d) $2(x^2 - 4x)$

13. Which of the following could represent the graph of a function?
    a) A circle centered at the origin
    b) A U-shaped parabola opening upward
    c) A sideways parabola (opening left or right)
    d) A vertical line

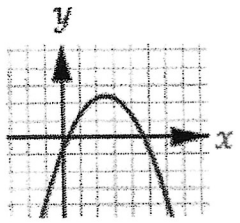
14. The function $f(x) = \sqrt{x - 3}$ is defined for which values of x, and what is its range?
    a) Domain: $x \geq 3$; Range: $[0, \infty)$
    b) Domain: $x > 3$; Range: $(0, \infty)$
    c) Domain: all real numbers; Range: $(-\infty, \infty)$
    d) Domain: $x \leq 3$; Range: $[0, \infty)$

15. The quadratic function f is given by $f(x) = ax^2 + bx + c$, where a and c are positive real numbers. Which of the following is the possible graph of $f(x)$?

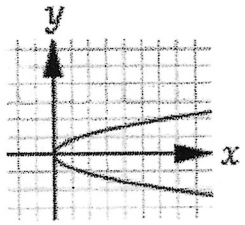
a)



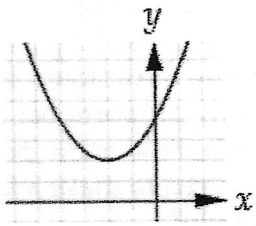
b)



c)



d)



16. If $h(x) = 6 + \frac{x^2}{4}$ and $h(2m) = 5m$, what is one possible value of m?
    a) 3
    b) 1
    c) 0
    d) -1

17. If $8 = a^y$, then $8a^2 =$?
    a) a^{y^2}
    b) a^{y+2}
    c) $8a^y$
    d) a^{8y}

18. If $x^{\frac{3}{2}} = \frac{1}{27}$, then what does x equal?
    a) -9
    b) -3
    c) $\frac{1}{9}$
    d) $-\frac{1}{9}$

19. $\frac{2}{(x+y)^{-\frac{2}{3}}} = (x+y)^{-\frac{1}{3}}$, which of the following must be true?
    a) $x = 0$
    b) $\sqrt{x+y} = 2$
    c) $\sqrt{x+y} = \frac{1}{2}$
    d) $x + y = \frac{1}{2}$

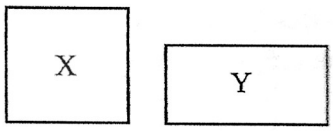
20. A recipe for a cake that serves 8 people requires 1.2 pounds of flour. Assuming the amount of flour needed is directly proportional to the number of people, how many pounds of flour are required to make a large cake for 240 people?
    a) 20
    b) 26
    c) 30
    d) 36

21. If y is inversely proportional to x and y is equal to 12 when x is equal to 8, what is the value of y when $x = 24$?
    a) $\frac{1}{6}$
    b) 4
    c) 1
    d) $\frac{1}{4}$

22. Amy can paint a room in 6 hours. Ben can paint the same room in 4 hours. If Amy and Ben work together, how long will it take them to paint the room?
    a) $\frac{10}{3}$ hours
    b) 2 hours
    c) $\frac{12}{5}$ hours
    d) 3 hours

23. Freddy's family owns two types of cars: a sedan and an SUV. The sedan gets 25 miles per gallon, and the SUV gets 20 miles per gallon. If both cars use the same amount of gasoline and the sedan travels 100 miles, how many miles does the SUV travel?

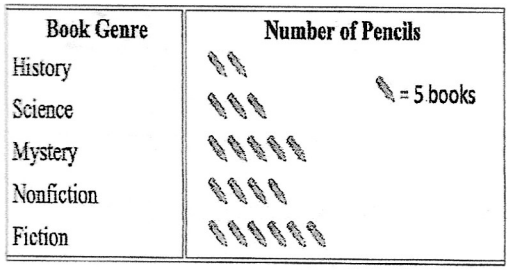
24. A store sells a certain brand of TV for $550 each. This price is 25 percent more than the store's purchase cost Employees can buy one of these TVs at 20 percent off the store's cost. How much would it cost an employee to purchase a TV of this brand?
    a) $352
    b) $320
    c) $410
    d) $425



25. Two rectangles, X and Y, are shown above. The width of rectangle Y is 25 percent less than the width of rectangle X, and the length of rectangle Y is 25 percent greater than the length of rectangle X. What is the area of rectangle Y compared to the area of rectangle X?
    a) The area of rectangle Y is 25 percent less than the area of rectangle X.
    b) The area of rectangle Y is 6 percent less than the area of rectangle X.
    c) Both rectangles have the same area.
    d) The area of rectangle Y is 6 percent greater than the area of rectangle X.

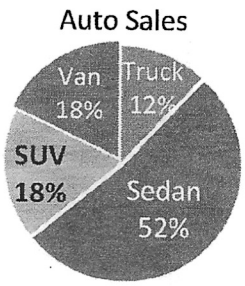
26. Which of the following could be the sum of 8 numbers if their average is greater than 9 and less than 10?
    a) 85
    b) 83
    c) 82
    d) 79

27. A class took a math test. The teacher reported that the average (mean) score was 75, the median was 80, and the mode was 90. Which of the following statements must be true?
    a) Most students scored 90.
    b) The highest score is 90.
    c) More students scored below 75 than above
    d) 90 is the most frequently occurring score.

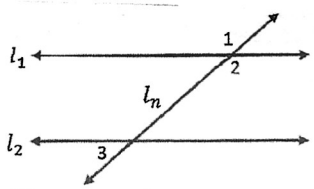


Books Sold by Genre

28. According to the pictograph above, what percentage of the total books sold were Mystery books?
    a) 20%
    b) 25%
    c) 29%
    d) 34%



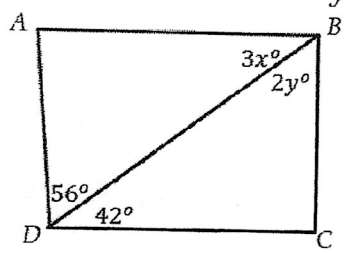
29. The pie graph above shows the types of automobiles sold by a dealer in 2010. If the dealer sold 40 more Sedans than all other types combined, how many automobiles were sold in total?



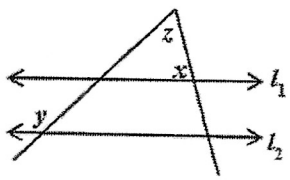
Note: Figure not drawn to scale.

30. In the figure above, lines l_1 and l_2 are parallel and $\angle 1 = 140^o$, what is the measure of $\angle 3$?
    a) 40^o
    b) 60^o
    c) 120^o
    d) 140^o

31. In the figure below, $\overline{AB} \parallel \overline{CD}$ and $\overline{CD} \perp \overline{BC}$. What is the value of $x + y$?

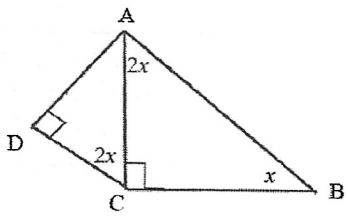


    a) 21
    b) 34
    c) 36
    d) 38

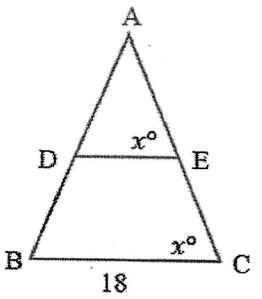


32. In the figure above, if $l_1 \parallel l_2$, what does z equal in terms of x and y?
    a) $x - y$
    b) $y - x$
    c) $180° - y + x$
    d) $180° - x - y$

33. In the figure below, AB = 2. What is the length of AD?

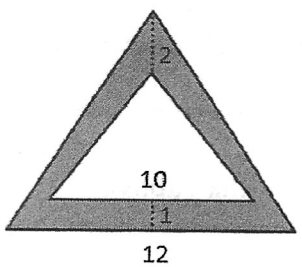


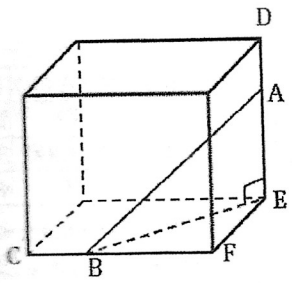
    a) $\sqrt{3}$
    b) 1
    c) $\frac{1}{2}$
    d) $\frac{\sqrt{3}}{2}$



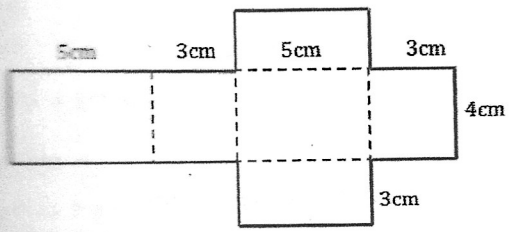
34. In the figure above, if $\overline{AD} = \overline{DB}$, what is the length of $\overline{DE}$?
    a) 6
    b) 9
    c) $9\sqrt{2}$
    d) 12

35. In the figure below, the area of the shaded region is 26 square units. What is the height of the smaller triangle?

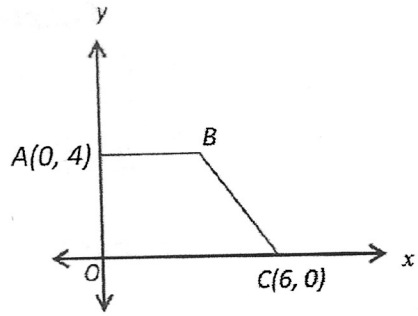




36. The cube shown above has edges of length 3. If $\overline{CB} = \overline{AD} = 1$, what is the length of $\overline{AB}$?



37. If the figure above is folded along the dashed lines, it forms a rectangular box. What is the volume of the box, in cubic centimeters?
    a) 15
    b) 20
    c) 40
    d) 60



38. In the xy-coordinate plane, AB is parallel to the x-axis. If AO = AB, what is the area of quadrilateral ABCO?
    a) 12
    b) 16
    c) 18
    d) 20

39. A ladder leans against a wall, forming a 70^o angle with the ground. If the ladder is 15 feet long, how high does it reach on the wall?
    a) 12.5
    b) 14.1
    c) 15.2
    d) 16.1

40. If $sin(x) = 0.8$ and x is an acute agnle, which of the following is true?
    a) $cos(x) = 0.6$
    b) $cos(90^o - x) = 0.6$
    c) $cos(90^o - x) = 0.8$
    d) $sin(90^o - x) = 0.6$