Directions: Choose the best answer for each of the following problems. Choice E is "NOT" for "None of these".

1. $1 + 2 + 3 + 4 + \ldots + 11 =$

   A. 66   B. 64   C. 62   D. 60   E. NOT

2. $\left(\dfrac{2}{5}\right)^2 \times \left(2\dfrac{1}{2}\right)^3 =$

   A. $\dfrac{4}{25}$ B. $6\dfrac{1}{4}$ C. $\dfrac{2}{5}$ D. $2\dfrac{1}{2}$ E. NOT

3. A running back ran 124 yards and 88 yards in his first two games of the season. How many yards should he average in each of his next two games to have a total of 400 yards?

   A. 92 yards   B. 94 yards   C. 96 yards   D. 98 yards   E. NOT

4. There are a total of 68 students in Ms. Walker's college algebra class. If there are 24 men, what is the ratio of women to men students in the class?

   A. $\dfrac{5}{6}$ B. $\dfrac{11}{5}$ C. $\dfrac{6}{5}$ D. $\dfrac{11}{6}$ E. NOT

5. A train traveled at 30 mph for $1\dfrac{1}{2}$ hours and then 40 mph for $2\dfrac{1}{4}$ hours. How far did the train travel?

   A. 135 miles   B. 145 miles   C. 155 miles   D. 165 miles   E. NOT

6. Forty percent of sales at a restaurant comes from taco sales. On Tuesday, the restaurant had a total of $3400 in sales. How much of these sales where from tacos?

   A. $1080   B. $1360   C. $1780   D. $2040   E. NOT

7. $7\dfrac{3}{4} \times 1\dfrac{3}{4} =$

   A. $15\dfrac{9}{16}$ B. $13\dfrac{9}{16}$ C. $11\dfrac{9}{16}$ D. $9\dfrac{9}{16}$ E. NOT

8. A square has a perimeter of 30 cm. If a rectangle with the same perimeter is found with the length twice the width, how much smaller is the area of the rectangle than the area of the square?

   A. $5\,\text{cm}^2$ B. $6\dfrac{1}{4}\,\text{cm}^2$ C. $7\dfrac{1}{2}\,\text{cm}^2$ D. $10\,\text{cm}^2$ E. NOT

9. The sum of the next three numbers in the sequence 5, 7, 12, 19, 31, ... is

   A. 278   B. 248   C. 250   D. 262   E. NOT

10. Bob and Cat start walking around a circular track from the same spot, but going in opposite directions. Bob is walking at 4 feet per second while Cat is walking at 5 feet per second. When they meet the first time, Bob has walked 360 feet. What is the circumference of the track?

    A. 810 yards   B. 540 yards   C. 270 yards   D. 180 yards   E. NOT

11. Each girl in a scouting troop sold two dozen boxes of cookies. Each box sold for $6.00. If the number of girls in the troop is G, which expression gives the total amount earned from cookies sales?

    A. $144G$ B. $\dfrac{144}{G}$ C. $24G$ D. $\dfrac{24}{G}$ E. NOT

12. Betty has a ribbon that is $7\dfrac{1}{2}$ yards long. If she cuts the ribbon into equal pieces of length $1\dfrac{1}{2}$ inches, how many pieces will she have?

    A. 300   B. 240   C. 180   D. 120   E. NOT

13. How many positive integers will evenly divide into the number 30?

    A. 12   B. 10   C. 8   D. 6   E. NOT

14. Multiply $(4.2 \times 10^7) \times (3 \times 10^8)$.

    A. 1.26×10^{57} B. 1.26×10^{56} C. 1.26×10^{15} D. 1.26×10^{16} E. NOT

15. 41 (base 10) = _____ (base 6)

    A. 105   B. 155   C. 115   D. 15   E. NOT

16. A regular pentagon has a perimeter of $8\dfrac{1}{3}$ cm. What is the length of each side?

    A. $1\dfrac{1}{3}$ cm   B. $\dfrac{5}{6}$ cm   C. $1\dfrac{2}{3}$ cm   D. $1\dfrac{1}{2}$ cm   E. NOT

17. How many of these numbers are irrational?

$$0 \qquad \sqrt{3} \qquad \pi \qquad \frac{1}{2} \qquad 0.4747...$$

   A. 0   B. 1   C. 2   D. 3   E. NOT

18. Find the least common multiple of 28, 30, and 36.

   A. 1260   B. 1280   C. 1320   D. 1340   E. NOT
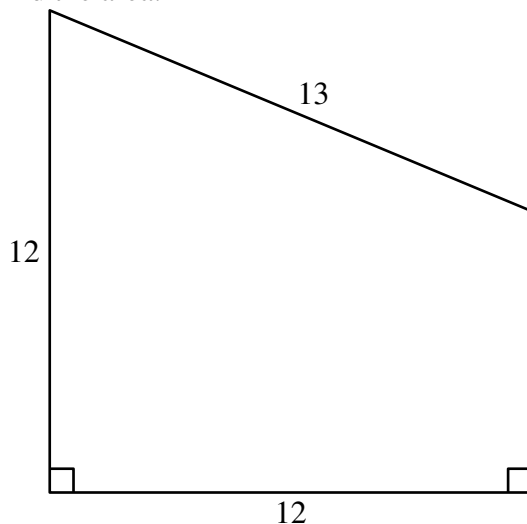
19. The letter M represents a single digit. Find M if the number 5M7843 is evenly divisible by 11.

   A. 8   B. 7   C. 6   D. 5   E. NOT

20. How many distinct pairs of primes can be used to sum to 54? (Pairs listed in the opposite order still count as the same pair.)

   A. 6   B. 5   C. 4   D. 3   E. NOT

21. Find the area.
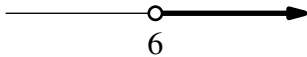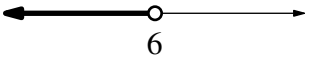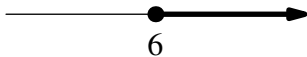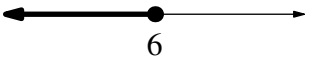

   A. 104
   B. 108
   C. 114
   D. 118
   E. NOT

22. The triangular numbers are 1, 3, 6, 10, 15, ... What is the sum of the 11th and 12th triangular numbers?

   A. 172   B. 168   C. 144   D. 132   E. NOT
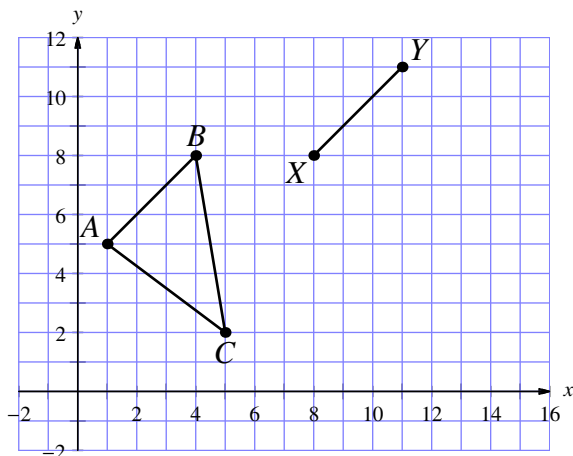
23. A book costs $8.00 before tax and $8.60 after tax. Find the tax rate.

   A. $7\frac{1}{2}\%$ B. $8\frac{1}{4}\%$ C. $6\frac{3}{4}\%$ D. $6\frac{1}{2}\%$ E. NOT

24. 0.32222... = _____ (fraction)

    A. $\dfrac{31}{90}$ B. $\dfrac{29}{90}$ C. $\dfrac{32}{99}$ D. $\dfrac{1}{3}$ E. NOT

25. Find the area of the triangle formed in the first quadrant by the *x*- and *y*-axes and the line $y = 30 - 3x$.

    A. 225   B. 75   C. 150   D. 300   E. NOT

26. Anna is three years younger than Bill and two years older than Carl. In eight years, the sum of Bill and Carl's ages will be 53. What is the sum of Anna and Bill's ages now?

    A. 35   B. 38   C. 39   D. 34   E. NOT

27. If $f(x) = 6x^2 - 6$, then $f(1) + f(0) + f(-1) =$

    A. 18   B. -18 C. 0   D. 6   E. NOT

28. $\dfrac{13}{5} + \dfrac{5}{13} =$

    A. $2\dfrac{24}{65}$ B. $2\dfrac{16}{65}$ C. $2\dfrac{64}{65}$ D. $2\dfrac{8}{65}$ E. NOT

29. When a 20-foot tall telephone pole has a shadow of 30 feet, what is the length of the shadow of a 6-foot tall horse?

    A. 16 feet   B. 6 feet   C. 9 feet   D. 4 feet   E. NOT

30. Find the total surface area of a cube whose volume is 27 cm^3.

    A. 18 cm^2 B. 54 cm^2 C. 60 cm^2 D. 81 cm^2 E. NOT

31. A 20-ounce drink costs $1.20. A 32-ounce drink costs $1.60. Assuming a linear relationship between size and cost, which of the following gives the cost *C* of a drink with *x* ounces?

    A. $C = \dfrac{1}{15}x + \dfrac{8}{15}$ B. $C = \dfrac{1}{30}x + \dfrac{1}{3}$ C. $C = \dfrac{1}{15}x + \dfrac{1}{3}$ D. $C = \dfrac{1}{30}x + \dfrac{8}{15}$ E. NOT

32. Find the product of the roots of $5x^2 - 6x + 1 = 0$.

    A. 0.2   B. -0.2 C. 1.2   D. -1.2 E. NOT

33. A pair of dice is rolled. Find the probability of getting a sum of 3 or 4.

    A. $\dfrac{5}{36}$ B. $\dfrac{1}{9}$ C. $\dfrac{1}{2}$ D. $\dfrac{1}{4}$ E. NOT

34. Charlie borrowed $2400 at 5.5% simple annual interest for 3 years. How much does he have to repay?

    A. $2668   B. $2796   C. $2848   D. $2906   E. NOT

35. Solve for t: $3t - 4[5 - (t + 7)] = 6(t - 1)$

    A. -16 B. -18 C. -12 D. -14 E. NOT

36. How many x-intercepts does the graph $y = 5 - 2x - x^2$ have?

    A. 0   B. 1   C. 2   D. 3   E. NOT

37. Which transformation is used to change $y = \sqrt{x}$ into $y = -\sqrt{x}$?

    A. vertical shift   B. reflection over x-axis

    C. horizontal shift   D. reflection over y-axis   E. NOT

38. Solve for x: $4^{3-2x} = 8$

    A. $\dfrac{1}{4}$ B. $\dfrac{3}{4}$ C. $-\dfrac{1}{4}$ D. $-\dfrac{3}{4}$ E. NOT

39. How many ways can the letters B, B, C, C, D, and D be rearranged to form different 6-letter pass-words?

    A. 180   B. 72   C. 90   D. 120   E. NOT

40. Find the remainder when $x^2 - 4x + 7$ is divided by $x - 3$.

    A. 4   B. -3 C. 2   D. 0   E. NOT

41. Which of the following is the graphical solution to the inequality $3x > 18$?

    A.   6   B.   6

    C.   6   D.   6   E. NOT

42. When triangle *ABC* is translated to triangle *XYZ*, point *Z* will have what coordinates?

  A. $(11,6)$
  B. $(12,5)$
  C. $(12,6)$
  D. $(11,5)$
  E. NOT

43. Find the value of $\sqrt{16} + \sqrt{25} + \sqrt{(16)(25)}$.

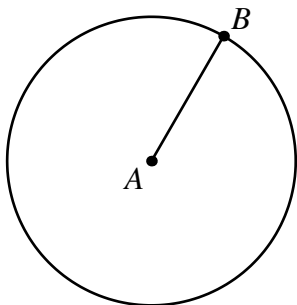 A. 29   B. 31   C. 33   D. 35   E. NOT

44. If *H* is inversely proportional to *J* and *H* = 6 when *J* = 12, what is *H* when *J* = 24?

  A. 24   B. 12   C. 2   D. 3   E. NOT

45. A student council has six students. How many ways can the President and Secretary of the student council be selected from these six students?

  A. 30   B. 15   C. 24   D. 12   E. NOT

46. What name is given to segment *BA* in circle *A*?

  A. secant
  B. chord
  C. radius
  D. diameter
  E. NOT

47. If two angles of a triangle are 42° and 73°, what is the third angle?

  A. 75°   B. 65°   C. 58°   D. 48°   E. NOT

48. $\dfrac{(9^7)(27^2)^{-3}}{(3^4)^{-5}} =$

    A. 3^{12} B. 3^{14} C. 3^{16} D. 3^{18} E. NOT

49. What is the remainder when 12^{10} is divided by 11?

    A. 6   B. 5   C. 10   D. 1   E. NOT

50. From the system (x, y) for the system $\begin{cases} 3x - 4y = 7 \\ 2x + 9y = -7 \end{cases}$ Find $\dfrac{y}{x}$.

    A. -2 B. 2   C. 1   D. -1 E. NOT