

1. Multiply: $\sqrt{24} \cdot \sqrt{18} \cdot \sqrt{12}$. 1. _____
2. A man who is six feet tall casts a shadow 15 feet long at the same time the shadow of a tree measures 75 feet. How many feet tall is the tree? 2. _____
3. What is the identity element for the \star operation shown in the table? 3. _____

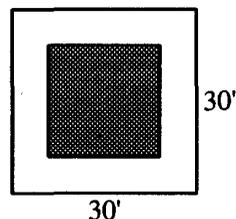
\star	a	b	c
a	b	a	b
b	a	b	c
c	b	c	c

4. If $a = 3$, $b = -2$, and $c = -1$, what is the value of $a^c + b^a + c^b$? Express your answer as a mixed number. 4. _____
5. Which of the following is largest? $\sqrt{75}$ $\frac{75}{9}$ 50% of $\frac{68}{4}$ 5. _____
6. A student begins her research at the library at 9:10 AM. She estimates her work will take 4.7 hours to complete and she plans to take a 15-minute break and a 30-minute lunch. At what time should she expect to finish? 6. _____
7. 13.72 is what percent of 6860? Express your answer to the nearest tenth of a percent. 7. _____
8. The product of two consecutive odd negative integers is 1443. What is the smaller of the two integers? 8. _____
9. Find the point of intersection between the horizontal line through $(-5, 3)$ and the vertical line through $(7, 7)$. 9. _____
10. If two fair dice numbered one through six are tossed, what is the probability that the sum of the faces showing is a multiple of 3? 10. _____
11. 12% of 50 is what percent of 24? 11. _____
12. Compute: $86 + 186 + 286 + \dots + 986$. 12. _____
13. What is the absolute value of the difference between the median and the mean of the set $\{32, 18, 45, 63, 22\}$? 13. _____
14. What is the sum of the next two multiples of 3 after 47? 14. _____

15. How many distinct four-digit numbers are there that contain two 4's, one 5, and one 6 ? 15. _____
16. Compute 1.67% of 10 and express the answer as a decimal. 16. _____
17. Kathy made \$5,400 commission on the sale of a \$120,000 home. What is her commission rate expressed as a percent? 17. _____
18. Suppose that the two-digit numbers written \overline{AB} and \overline{BA} are both prime, where A and B are distinct digits. What is the smallest possible sum of A and B ? 18. _____
19. What real number cannot be written in the form $\frac{m^2 - 4}{2 - m}$ for any value of m ? 19. _____
20. Find x such that $|x + 2| = |x - 3|$. 20. _____
21. An express elevator moves at the speed of three floors in ten seconds. How many floors does it move per second? Express your answer as a decimal. 21. _____
22. The number of diagonals of a certain polygon is twice the number of sides. How many sides does the polygon have? 22. _____
23. The bases of a trapezoid are 6 inches and 12 inches in length. If the altitude is 4 inches, how many square feet are in the area of the trapezoid? Express your answer as a common fraction. 23. _____
24. Find X in terms of degrees. 24. _____

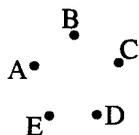
$$\frac{X + 15}{2X + 15}$$

25. What is the altitude of an equilateral triangle which has a side of 12 ? 25. _____
26. Find the area of the shaded square figure if the border around it is 6 feet wide. 26. _____



27. What is the least common multiple of 24, 54, and 144 ? 27. _____
28. Simplify: $(\frac{1}{2}) \cdot (\frac{1}{3}) - (\frac{1}{3}) \div (\frac{1}{2})$. 28. _____
29. Find the length of the interior diagonal of a cube whose edge is 15. 29. _____
30. The Fibonacci sequence begins 1, 1, 2, 3, Each term of the sequence is the sum of the two terms immediately preceding it. Find the sum of the first six terms. 30. _____
31. Find the sum of all positive integers less than 100 which are divisible by nine. 31. _____
32. A pair of \$250 skis is on sale for \$180. Express the discount as a percent of the original price. 32. _____
33. A collection of 37 coins contains nickels and dimes. If the collection is worth \$2.40, how many dimes does the collection contain? 33. _____
34. A fair die, with faces numbered 1 through 6, is tossed. What is the probability that the top face of the die is a number greater than 2 ? Express your answer as a common fraction. 34. _____
35. Write the product in scientific notation: $(1.4 \times 10^6)(0.3 \times 10^{-2})$. 35. _____
36. Simplify: $4 - 8[3^2 - 4(-3)]$. 36. _____
37. What is the measure in degrees of the acute angle formed by the hour and minute hand of a clock at 5:20 PM? 37. _____
38. The letters in the word COUNTS are to be written down in some order from left to right. In how many different ways can this be done? 38. _____
39. Simplify and express your answer as a common fraction. 39. _____
- $$\frac{\frac{1}{20}}{\frac{1}{2}} \div \frac{1}{5}$$
40. If the diagonal of a square is 12 centimeters, how many square centimeters are in the area of the square? 40. _____

41. How many lines are there that each pass through at least two of the points A, B, C, D, and E shown?



41. _____

42. Carpet for a 10' x 18' room costs \$11.00 per square yard. How much will it cost to carpet this room?

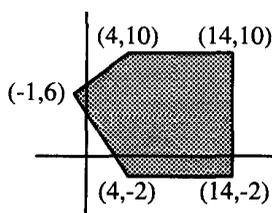
42. _____

43. What is the sum of the 4 smallest prime numbers greater than 25?

43. _____

44. Find the area of the shaded region in the diagram.

44. _____



45. Find the equation of the form $y = ax + b$ of the line which contains the point (1, 4) and which is perpendicular to the line $x = 6$.

45. _____

46. 20 is 125% of what number?

46. _____

47. The three angles of a triangle form an arithmetic sequence. What is the number of degrees of the middle angle?

47. _____

48. What is the volume in cubic feet of a box whose dimensions are 30 inches by 16 inches by 36 inches?

48. _____

49. Given that $f(x) = 2x - 3$ for all x , for what value of x does $f(x) = 5$?

49. _____

50. Find the value of $7(299) + 9(299) + 14(299) + 30$.

50. _____

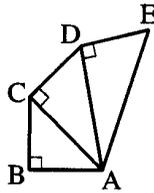
51. What is the sum: $5 + 10 + 15 + \dots + 95$?

51. _____

52. What is the value of $\frac{|2-8|}{-3}$?

52. _____

53. If \overline{AB} , \overline{BC} , \overline{CD} , and \overline{DE} all have length 1 what is the length of \overline{AE} ?



53. _____

54. What is the sum of the first 20 positive even integers?

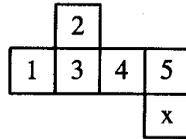
54. _____

55. What is the smallest possible value of the fraction $\frac{a}{b}$ if (1) $3 \leq a \leq 5$ and (2) $5 \leq b \leq 10$? Express your answer as a common fraction.

55. _____

56. When folded to form a cube, what is the value in the square opposite the one marked x?

56. _____



57. Express as a decimal the value of $\frac{1}{2} + \frac{1}{4} + \frac{1}{10} + \frac{1}{20} + \frac{1}{100}$.

57. _____

58. Evaluate $(2^2 + 2^3 + 2^4) \div 4$.

58. _____

59. A triangle with sides 6, 8, and 10 is inscribed in a circle. What is the radius of the circle?

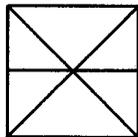
59. _____

60. Find the value of $\frac{101^2 - 100^2}{3}$.

60. _____

61. How many triangles can be traced using the segments in this diagram?

61. _____



62. The sum of five consecutive integers is 45. What is the average value of the integers?

62. _____

63. The two circles of radius 5 intersect so that the area of their intersection is 6π . In terms of π , what is the area of their union?

63. _____

