

1. Sharon bought a mixture of nuts that was made up of pecans, walnuts and cashews in a ratio by weight of 2:3:1, respectively. If she bought 9 pounds of nuts, how many pounds of walnuts were in the mixture? Express your answer as a decimal to the nearest tenth.

1. \_\_\_\_\_ pounds



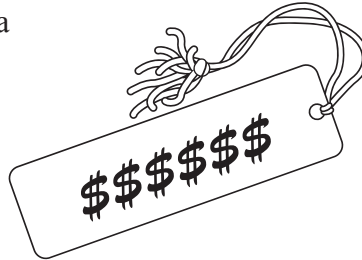
2. A bookcase has 3 shelves. On the top shelf there are 10 German books, on the middle shelf 12 math books and on the bottom shelf 8 science books. When six German books are removed from the bookcase, what fraction of the bookcase's remaining books are math books? Express your answer as a common fraction.

2. \_\_\_\_\_

3. What is the sum of the units digits of all the multiples of 3 between 0 and 50?

3. \_\_\_\_\_

4. An item in a store is originally priced at \$4.00. A clerk marks the item up by 100%. After that, a second clerk marks the new price up by 200%. What was the final price after the two markups?



4. \$ \_\_\_\_\_

5. The points  $(4, 0)$  and  $(-4, 0)$  are two non-consecutive vertices of a rhombus with an area of 80 square units. One of the other vertices is  $(0, K)$  where  $K > 0$ . What is the value of  $K$ ?

5. \_\_\_\_\_

6. Jan is as old now as Gary was 15 years ago. Six years from now, Gary will be twice as old as Jan will be then. How old is Gary now?

6. \_\_\_\_\_ years



7. If three flicks are equivalent to eight flecks and six flocks are equivalent to four flecks, how many flocks are equivalent to 12 flicks?

7. \_\_\_\_\_ flocks

8. The integer  $m$  is between 30 and 80 and is a multiple of 6. When  $m$  is divided by 8, the remainder is 2. Similarly, when  $m$  is divided by 5, the remainder is 2. What is the value of  $m$ ?

8. \_\_\_\_\_

9. It took 4 days for 75 workers, all working together at the same rate, to build an embankment. If only 50 workers had been available, how many total days would it have taken to build the embankment?

9. \_\_\_\_\_ days



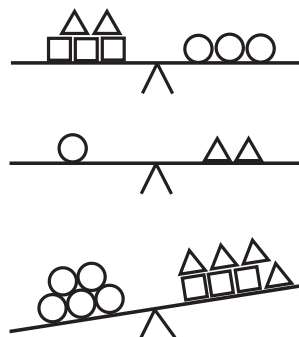
10. Hector spent a total of exactly \$200 on shirts and pants. The shirts cost \$15 each and the pants cost \$22 each. How many shirts did Hector buy?

10. \_\_\_\_\_ shirts

11. How many ounces of pure water must be added to 30 ounces of a 30% solution of acid to yield a solution that is 20% acid?

11. \_\_\_\_\_ ounces

12. If only triangles may be used, how many additional triangles must be added to the right side of the third scale so that it is balanced? (The distance of the objects from the centers of these scales is not relevant.)



12. \_\_\_\_\_ triangles

13. The sum of the first 20 positive even integers is also the sum of four consecutive even integers. What is the largest of these four integers?

13. \_\_\_\_\_

14. Six black chips have been placed on the game board shown. What is the sum of the numbers in the two squares where the seventh and eighth chips must be placed so that each row contains exactly 2 chips and each column contains exactly 2 chips?

1	●	3	●
●	6	7	●
9	●	11	12
13	14	●	16

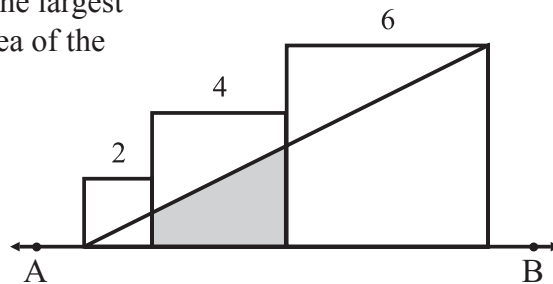
14. \_\_\_\_\_

15. A set of seven distinct positive integers has its mean and its median both equal to 30. What is the largest possible integer this set can contain?

15. \_\_\_\_\_

16. Three coplanar squares with sides of lengths two, four and six units, respectively, are arranged side-by-side, as shown so that one side of each square lies on line AB and a segment connects the bottom left corner of the smallest square to the upper right corner of the largest square. What is the area of the shaded quadrilateral?

16. \_\_\_\_\_ sq units

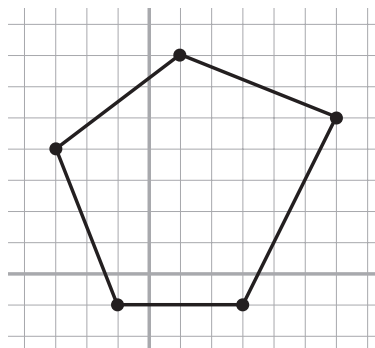


17. The fifth term of a geometric sequence of positive numbers is 11 and the eleventh term is 5. What is the eighth term of the sequence? Express your answer in simplest radical form.

17. \_\_\_\_\_

\_\_\_\_\_ **11** \_\_\_\_\_ **5** \_\_\_\_\_

18. The vertices of a convex pentagon are  $(-1, -1)$ ,  $(-3, 4)$ ,  $(1, 7)$ ,  $(6, 5)$  and  $(3, -1)$ . What is the area of the pentagon?



18. \_\_\_\_\_ sq units

19. A car passes point A driving at a constant rate of 60 km per hour. A second car, traveling at a constant rate of 75 km per hour, passes the same point A a while later and then follows the first car. It catches the first car after traveling a distance of 75 km past point A. How many minutes after the first car passed point A did the second car pass point A?



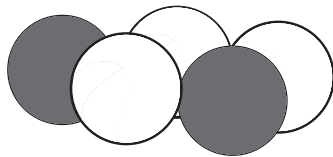
19. \_\_\_\_\_ minutes

20. When the square of three times a positive integer is decreased by the integer, the result is 2010. What is the integer?

20. \_\_\_\_\_

21. Bag A contains 3 white and 2 red balls. Bag B contains 6 white and 3 red balls. One of the two bags will be chosen at random, and then two balls will be drawn from that bag at random without replacement. What is the probability that the two balls drawn will be the same color? Express your answer as a common fraction.

21. \_\_\_\_\_



22. The base 9 representation of a positive integer is AB and its base 7 representation is BA. What is the integer expressed in base 10?

22. \_\_\_\_\_

23. For how many positive values of  $n$  are both  $\frac{n}{3}$  and  $3n$  four-digit integers?

23. \_\_\_\_\_ values

24. If  $3^{x+y} = 81$  and  $81^{x-y} = 3$ , then what is the value of the product  $xy$ ? Express your answer as a common fraction.

24. \_\_\_\_\_

25. In rectangle ABCD, points E and F lie on segments AB and CD, respectively, such that  $AE = \frac{AB}{3}$  and  $CF = \frac{CD}{2}$ . Segment BD intersects segment EF at P. What fraction of the area of rectangle ABCD lies in triangle EBP? Express your answer as a common fraction.

25. \_\_\_\_\_

26. The points (1, 7), (13, 16) and (5,  $k$ ), where  $k$  is an integer, are vertices of a triangle. What is the sum of the values of  $k$  for which the area of the triangle is a minimum?

26. \_\_\_\_\_

27. What is the value of  $x$  for which  $\sqrt{x + \sqrt{x + \sqrt{x + \dots}}} = 5$ ?

27. \_\_\_\_\_

28. If  $a$  and  $b$  are integers with  $a > b$ , what is the smallest possible positive value of  $\frac{a+b}{a-b} + \frac{a-b}{a+b}$ ?

28. \_\_\_\_\_

29. The positive integers A, B and C form an arithmetic sequence while the integers B, C and D form a geometric sequence. If  $\frac{C}{B} = \frac{5}{3}$ , what is the smallest possible value of  $A + B + C + D$ ?

29. \_\_\_\_\_

30. Point D lies on side AC of equilateral triangle ABC such that the measure of angle DBC is 45 degrees. What is the ratio of the area of triangle ADB to the area of triangle CDB? Express your answer as a common fraction in simplest radical form.

30. \_\_\_\_\_