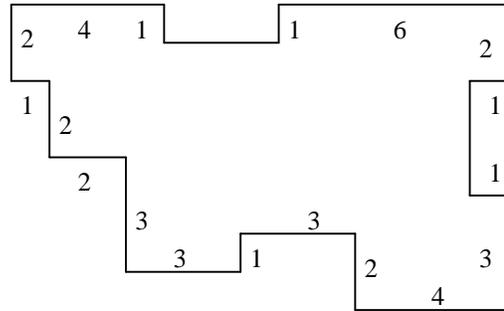


## 2007 Rocket City Junior Math Mania Individual Test – 8th Grade

1. Two numbers sum to 55 and differ by 17. What is the value of the smaller number?

2. Evaluate: 
$$\begin{array}{r} 345 \\ +678 \\ \hline \end{array}$$

3. What is the perimeter of the figure shown, in which all angles are right angles?



4. In a recent pudding survey of 35 people, 21 liked butterscotch, 23 liked tapioca, and 6 liked neither. How many people surveyed liked both flavors?
5. What is the greatest common factor of 42 and 70?
6. What value(s) of  $a$  satisfy  $3a + 4 = 58$ ?
7. How many hours are there in two weeks?
8. How many diagonals can be drawn in a convex septagon (7-gon)?
9. In how many ways can four red bricks and seven black bricks be arranged symmetrically in a row? (e.g. RRBBBBBBRR)
10. What is the sum of the squares of the fifteen smallest positive integers?
11. A triangle has two interior angles measuring  $34^\circ$  and  $72^\circ$ . What is the measure of the third angle, in degrees?
12. Evaluate:  $4^4$
13. Evaluate:  $4\frac{3}{8} \times 3\frac{3}{7}$
14. If Yanni can wash a car in 48 minutes and Willy can wash a car in 16 minutes, how many minutes will it take them to wash a car working together?
15. What is the slope of the line  $3x - 2y = 8$ ?
16. What is the volume, in cubic centimeters, of a right circular cylinder with a base radius measuring 6 cm and a height measuring 7 cm?

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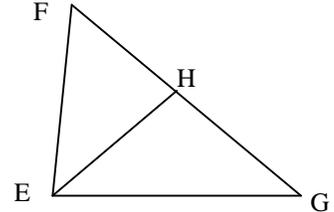
17. Express 4321 **in scientific notation**.

18. Evaluate:  $-8(-7) - 9$

19. What are the coordinates, in the form  $(x, y)$ , of the y-intercept of the line  $2x + 3y = 24$ ?

20. When two dice are rolled, what is the probability that there is at least one three but no twos or ones?

21. In  $\triangle EFG$ ,  $EF = 8$  cm,  $EG = 12$  cm, and  $FG = 15$  cm. If  $H$  is selected on  $\overline{FG}$  such that  $\overline{EH}$  bisects  $\angle E$ , what is the length of  $\overline{HG}$  in centimeters?



22. Evaluate:  $5(4(3+2)+1) \div 7 - 6$

23. What are the coordinates, in the form  $(x, y)$ , of the point of intersection of the lines  $3x - y = 7$  and  $x + 2y = -7$ .

24. What value(s) of  $c$  satisfy  $c^2 - 3c - 5 = 0$ ?

25. What is the mean of the data set 1, 1, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4?

26. A bag contains three red and six blue marbles. What is the probability of getting two marbles of the same color when two marbles are drawn?

27. What is the area, in square centimeters, of an equilateral triangle with sides measuring 8 cm?

28. Express in simplest radical form:  $\sqrt{98}$

29. Perform the multiplication and combine like terms:  $(d - 4)(2d + 3)$

30. What are the coordinates, in the form  $(x, y)$ , of the rightmost x-intercept of the parabola with equation  $y = x^2 - 3x - 4$ ?