



## Mental Math

Test #343/362

Name: \_\_\_\_\_

ID Number: \_\_\_\_\_

School: \_\_\_\_\_

Division (circle one):

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- \_\_\_\_\_ 1. Simplify:  $\frac{5!4!}{3!2!}$
- \_\_\_\_\_ 2. A circle is inscribed in a square. What is the ratio of the area enclosed by the circle to the area enclosed by the square?
- \_\_\_\_\_ 3. A circle circumscribes a square. What is the ratio of the area enclosed by the circle to the area enclosed by the square?
- \_\_\_\_\_ 4. A leafblower has two settings: 150 mph and 235 mph. How much fast, in mph, is the faster speed than the slower one?
- \_\_\_\_\_ 5. Evaluate:  $3^4$
- \_\_\_\_\_ 6. Simplify:  $\frac{4}{3}a - \frac{1}{6}a - \frac{8}{5}b - \frac{9}{10}b$
- \_\_\_\_\_ 7. One stamp is randomly selected from a 10 by 10 sheet of 100 stamps. What is the probability, written as a reduced fraction, that the stamp is not a border stamp?
- \_\_\_\_\_ 8. Convert  $270^\circ$  into radians.
- \_\_\_\_\_ 9. Evaluate:  $1+2+3+\dots+n+\dots+10$
- \_\_\_\_\_ 10. Evaluate:  $1 \cdot 2 \cdot 3 \cdot \dots \cdot n \cdot \dots \cdot 10$
- \_\_\_\_\_ 11. Jane begins climbing a 14000 ft mountain at sea level, climbs 1000 ft each day while sliding down 500 ft each night. How many days of climbing are required for Jane to reach the summit of the mountain?
- \_\_\_\_\_ 12. Express in simplest fraction form:  $0.\overline{333}$
- \_\_\_\_\_ 13. What is the sum of the GCF and LCM of 14 and 21?
- \_\_\_\_\_ 14. A square with an enclosed area of 196 has a diagonal of what length?
- \_\_\_\_\_ 15. Evaluate:  $(i+1)(i-1)$
- \_\_\_\_\_ 16. Find the greatest prime number  $x < 60$ .
- \_\_\_\_\_ 17. Which property is represented by the equation  $9(4x+12) = 36x+108$ ?
- \_\_\_\_\_ 18. Simplify:  $\left(\frac{25}{16}\right)^{\frac{3}{2}}$
- \_\_\_\_\_ 19. The line  $2x+7y=4$  has what slope?
- \_\_\_\_\_ 20. If  $17+y-12=23$ , find  $y$ .
- \_\_\_\_\_ 21. If  $x+y=7$  and  $x-y=3$ ,  $xy=?$
- \_\_\_\_\_ 22. The product of three consecutive odd integers is 315. Find the sum of those three integers.
- \_\_\_\_\_ 23. A corn stalk is 2 ft tall on Monday. On any following Monday, the corn stalk is 50% taller than it was the previous Monday. The corn stalk will be over 5 ft tall in how many Mondays from the initial Monday?
- \_\_\_\_\_ 24. How many unique permutations of the letters in the word "MATH" exist?
- \_\_\_\_\_ 25. It is 4 pm in Paris and 7 pm in Dubai. Dubai is 10 hours ahead of St. Louis. How many hours ahead of St. Louis is Paris?
- \_\_\_\_\_ 26. Find the ratio, in a:b form, of the area of a  $16 \times 20$  print to that of an  $8 \times 10$  print.
- \_\_\_\_\_ 27. Simplify, where  $x \neq 0$ :  $\left(\left((x^2)^0\right)^1\right)^6$
- \_\_\_\_\_ 28. The midpoint of  $(-57, 64)$  and  $(43, 16)$  is?
- \_\_\_\_\_ 29. Find the area enclosed by a triangle with sides of length 8, 15, and 17.
- \_\_\_\_\_ 30. Expand:  $(x+20)(x+16)$
- \_\_\_\_\_ 31. Evaluate:  $-i^{20} \cdot i^{16}$ , where  $i = \sqrt{-1}$
- \_\_\_\_\_ 32. Calculate 16% of 20.
- \_\_\_\_\_ 33. Evaluate:  $\sqrt{8 \cdot 32}$
- \_\_\_\_\_ 34. What percentage of a class with 16 boys and 24 girls are girls?
- \_\_\_\_\_ 35. Kim has 25 nickels and \$2.75 total in nickels and dimes only. How many dimes does she have?
- \_\_\_\_\_ 36. Successive discounts of 10% and 20% are equivalent to what single discount?
- \_\_\_\_\_ 37. If the current time is 7:03 on a 12-hour clock, what time will it be in 553 minutes?
- \_\_\_\_\_ 38. When  $x=20.16$ , what is the value of  $2x+3x+4x+5x+6x$ ?
- \_\_\_\_\_ 39. What is the units' digit of  $1!+3!+5!?$
- \_\_\_\_\_ 40. What is the greatest integer whose cube is less than 1000?