

Dick Schaff Math Superbowl XLIV
Level 2: 8th Grade Blitz

- Directions: (1) Select the most correct answer for each question and bubble it in on your Scantron form.
(2) No calculating devices of any sort are allowed.
(3) N.O.T. stands for "None of these."

1. A photocopy machine costs \$3,000, plus an additional \$0.03 per copy. A fancy copy machine costs \$5000, but copies only cost an additional \$0.02 each. How many copies would you have to make before the costs are the same?
- a) 2,000 b) 20,000 c) 200,000 d) 2,000,000 e) N.O.T.
2. A line passes through the points $(2, -4)$ and $(6, -6)$. What is the equation of this line?
- a) $y = -\frac{1}{2}x - 4$ b) $y = -\frac{1}{2}x - 5$ c) $y = -\frac{1}{2}x - 6$ d) $y = -\frac{1}{2}x - 7$ e) N.O.T.
3. Solve $8(6 - 2x) = 9(5 - 3x)$ for x .
- a) $\frac{-11}{3}$ b) $\frac{-3}{11}$ c) $\frac{3}{11}$ d) $\frac{11}{3}$ e) N.O.T.
4. What is the volume of a right circular cylinder with height and diameter of 8 cm?
- a) $128\pi \text{ cm}^3$ b) $256\pi \text{ cm}^3$ c) $512\pi \text{ cm}^3$ d) $1024\pi \text{ cm}^3$ e) N.O.T.
5. What is the equation of the horizontal line that intersects the y -axis at -4 ?
- a) $y = x + 4$ b) $y = x - 4$ c) $y = -4$ d) $x = -4$ e) N.O.T.
6. What is the solution to the system $\begin{cases} 2x + y = 5 \\ 3x + 7y = 5 \end{cases}$?
- a) $(\frac{-30}{11}, \frac{-5}{11})$ b) $(\frac{30}{11}, \frac{-5}{11})$ c) $(\frac{-30}{11}, \frac{5}{11})$ d) $(\frac{30}{11}, \frac{5}{11})$ e) N.O.T.
7. What is 4.05×10^{-7} written in standard notation?
- a) 0.00000004005 b) 0.0000000405 c) 0.000004005 d) 0.000000405 e) N.O.T.
8. The number π is an example of which kind of number?
- a) counting b) integer c) imaginary d) irrational e) N.O.T.

17. A farm has seventeen horses. Each horse needs four shoes. Each shoe needs seven nails. Horseshoe nails come in packages of 50. How many packages of nails would you buy to shoe all of these horses?
a) 196 b) 476 c) 9 d) 10 e) N.O.T.
18. Alex has to sort through a comic book collection, deciding what to keep and what to sell. On the first day Alex was enthusiastic about the project, so Alex sorted through 56 comic books. Alex's enthusiasm waned after that, so for Alex only sorted through 28 comic books per day after that. Which of the following formulas models the total number of comic books sorted (N), as a function of days (d)?
a) $N = 28d + 56$ b) $N = 28d - 56$ c) $N = 28(d + 2)$ d) $N = 28(d + 1)$ e) N.O.T.
19. What is the supplement of a 30° angle?
a) 180° b) 90° c) 60° d) 30° e) N.O.T.
20. Which of the following fractions is equivalent to $0.01\bar{6}$?
a) $\frac{1}{6}$ b) $\frac{1}{60}$ c) $\frac{1}{3}$ d) $\frac{1}{30}$ e) N.O.T.
21. A triangle is plotted on the coordinate system so its vertices are at $(2, 3)$, $(2, 7)$, and $(11, 7)$. This triangle is then reflected about the y -axis. Which of the following would be coordinates for one of the vertices of the reflected triangle?
a) $(-2, 3)$ b) $(2, -7)$ c) $(-11, -7)$ d) $(11, 3)$ e) N.O.T.
22. Completely simplify $(p^5)^{-2}(p^{-3})^{-4}$.
a) p^{-4} b) p^2 c) p^{-120} d) p^{120} e) N.O.T.
23. On the coordinate plane, what is the distance between the origin and $(7, 24)$?
a) 25 b) 26 c) 30 d) 31 e) N.O.T.
24. What is the equation of the line passing through $(\frac{1}{4}, \frac{2}{7})$ and $(\frac{1}{2}, \frac{4}{7})$?
a) $y = \frac{8}{7}x - \frac{1}{7}$ b) $y = \frac{7}{8}x - \frac{1}{7}$ c) $y = \frac{8}{7}x$ d) $y = \frac{7}{8}x$ e) N.O.T.

The following information is needed for problems 25 – 27:

A number of Jr. High students were surveyed about their daily “screen time” (the time they spend watching television, working on a computer, or playing video games). The results are shown in the table below.

	Less than 1 hour	Between 1 and 3 hours	More than 3 hours
7 th Graders	2	10	8
8 th Graders	3	12	15

25. What is the relative frequency that a 7th grader was surveyed?
a) 20% b) 30% c) 40% d) 60% e) N.O.T.
26. What is the relative frequency that a student spent three hours or less in front of a screen?
a) 23% b) 27% c) 46% d) 54% e) N.O.T.
27. What is the relative frequency that a student spent an hour or more in front of a screen?
a) 23% b) 45% c) 46% d) 90% e) N.O.T.
28. Which two integers does $\sqrt{180}$ fall between?
a) 12 and 13 b) 13 and 14 c) 14 and 15 d) 15 and 16 e) N.O.T.
29. Set is four years older than Miles. In a year Set will be three times as old as Miles. How old is Set?
a) 5 b) 8 c) 11 d) 14 e) N.O.T.
30. Which of the following numbers is largest?
a) $2\frac{2}{3}$ b) $\frac{8}{3}$ c) 2.67 d) $2.\overline{66}$ e) N.O.T.
31. What is the volume of a sphere with radius π cm?
a) $\frac{4}{3}\pi$ cm³ b) $\frac{4}{3}\pi^2$ cm³ c) $\frac{4}{3}\pi^3$ cm³ d) $\frac{4}{3}\pi^4$ cm³ e) N.O.T.
32. Simplify $\frac{8.0 \times 10^7}{5.0 \times 10^3}$.
a) 1.6×10^4 b) 1.6×10^{10} c) 1.6×10^{-4} d) 1.6×10^{-10} e) N.O.T.

33. Which of the following is a factor of 2017?
a) 11 b) 13 c) 17 d) 19 e) N.O.T.
34. Which of the following is NOT equivalent to $\frac{8^3}{8^5}$?
a) $\frac{1}{8^2}$ b) 8^{-2} c) 2^{-8} d) 0.015625 e) N.O.T.
35. Chris buys ten packages of hot dog buns for a barbeque. Whole wheat hot dog buns come in packages of eight. Gluten-free hot dog buns come in packages of six. Chris has 76 hot dog buns. How many packages of whole wheat buns did Chris buy?
a) 2 b) 3 c) 6 d) 7 e) N.O.T.
36. Which of the following is equivalent to $\frac{2}{11}$?
a) 0.18 a) 0.22 a) $0.1\bar{8}$ a) $0.\bar{2}$ e) N.O.T.
37. Bobby pays \$26.19 for a used video game. This includes 8% sales tax. What was the price of the game before tax?
a) \$24.25 b) \$24.50 c) 24.75 d) \$26.11 e) N.O.T.
38. A rectangular garden has a perimeter of twenty feet. The length of the garden is two feet less than three times the width. Which of the following equations could be used to determine the width of the garden?
a) $20 = 2(3w + 2) + 2w$
b) $20 = 2(2w + 3) + 2w$
c) $20 = 2(3w - 2) + 2w$
d) $20 = 2(2w - 3) + 2w$
e) N.O.T.
39. What is the solution set of $6(2x - 6) = 4(3x - 9)$?
a) $\{-3\}$ b) $\{3\}$ c) $\{\}$ d) \mathbb{R} e) N.O.T.
40. Alex was driving along the highway at a speed of 65 mph at 1:00 p.m. Alex's speed slowly increased; at 1:20 p.m. Alex was driving 68 mph. If Alex's acceleration stayed constant, how fast was Alex driving at 3:00 p.m.?
a) 71 mph b) 74 mph c) 83 mph d) 95 mph e) N.O.T.

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