

Basic Math Skills

1. (B) Express $2\frac{1}{8}$ as an improper fraction: $\frac{17}{8}$. Then multiply numerators and denominators: $\frac{2}{3} \times \frac{17}{8} = \frac{34}{24}$. Finally, express this as a mixed number in lowest terms: $1\frac{10}{24} = 1\frac{5}{12}$.
2. (B) Think: $0.80x = 24$. Solve: $x = 24 \div 0.80$. The answer is 30.
3. (D) Set this up as a proportion: $\frac{2}{5} = \frac{x}{145}$. You may cross-multiply to solve: $2 \times 145 = 5x$. $290 = 5x$. $x = \frac{290}{5}$, or 58.
4. (A) First, determine how much Stu spent for the cups:
 $\$.25 \times 6 = \1.50 . Then find out what he spent for the plates:
 $\$.75 \times 6 = \4.50 . Add those sums: $\$1.50 + \$4.50 = \$6.00$. Finally, subtract that total from $\$10.00$: $\$10.00 - \$6.00 = \$4.00$.
5. (D) 1.25 equals $1\frac{25}{100}$, or $1\frac{1}{4}$ in lowest terms.
6. (4,000) One liter = 1,000 milliliters, so 4 liters = 4,000 milliliters.
7. (A) 2,000 = MM. 7 = VII.
8. (C) Multiplying a numbers with two digits to the right of the decimal point by a number with one digit to the right of the decimal point should result in a product with three digits to the right of the decimal point. However, since the final digit is 0, you can state the product as 0.33 rather than 0.330.
9. (B) Multiplying two numbers with two digits to the right of the decimal point should result in a product with four digits to the right of the decimal point. However, in this case, the final digit, 0, is dropped off.
10. (25) You are asked to find the percentage of SUVs out of the whole number of vehicles, so first you must add to find the number of vehicles in all: $7 + 7 + 28 + 14 = 56$. 14 is $\frac{1}{4}$ of 56, so the percentage of SUVs is 25%.
11. (D) There are 5 stars in our Arabic or decimal system of numbers. In the binary system, that would be 101, where 1 = 1 four, 0 = 0 twos, and 1 = 1 one.
12. (30) The least common denominator is the least number into which both denominators divide. Finding the common multiples is the easiest way to find this number. Factors of 6 = 6, 12, 18, 24, 30, 36. Multiples of 15 = 15, 30, 45, 60, 75. The least multiple that both numbers have in common is 30.
13. (D) Military time starts with hours before noon. After noon, 1:00 P.M. is 1300, 2:00 P.M. is 1400, and so on.
14. (D) You must find the ratio that is equivalent to 6:16. 60:160 would be equivalent, making choice A incorrect. 72:192 would be equivalent, making choice B incorrect. 120:320 would be equivalent, making choice C incorrect. The answer is choice D: multiplying both sides of the original ratio by 35 gives you 210:560.

15. (B) Begin by expressing the mixed numbers as improper fractions: $3\frac{1}{2} = \frac{7}{2}$, and $1\frac{1}{10} = \frac{11}{10}$. To divide by a fraction, multiply by its reciprocal. Therefore, $\frac{7}{2} \div \frac{11}{10} = \frac{7}{2} \times \frac{10}{11}$, or $\frac{70}{22}$. Now reduce to lowest terms: $\frac{70}{22} \div \frac{2}{2} = \frac{35}{11}$. Finally, express $\frac{35}{11}$ as a mixed number: $3\frac{2}{11}$.
16. (B) First, find $\frac{1}{3}$ of \$434.79 by dividing the total by 3—\$144.93. Subtract that from \$434.79 to find what Lenore has left after putting aside her share of the rent: $\$434.79 - \$144.93 = \$289.86$. Now subtract the amount she spends on groceries: $\$289.86 - \$75 = \$214.86$.
17. (94) $\$8.99 \times 6 = \53.94 . $\$3.99 \times 10 = \39.99 . Adding the two gives you $\$53.94 + \$39.99 = \$93.93$. Rounding that to the nearest dollar gives you \$94. Notice that in this case (although not in every case), rounding first before you multiply gives you the correct answer: $(\$9 \times 6) + (\$4 \times 10) = \$94$.
18. (A) Solve by dividing Clara's homes by the total and expressing the resulting decimal as a percent. $244 \div 1,525 = 0.16$, or 16%.
19. (D) Since 1 inch equals 2.54 centimeters, 12 inches (1 foot) equals 2.54×12 , or 30.48 centimeters.
20. (C) If 1 inch is equivalent to 6 inches, 6 inches is equivalent to 36 inches, or 1 yard.
21. (C) You can eliminate choices A and B here just by rounding each added to the nearest one and estimating the answer.
22. (15) In other words, $0.80x = 12$. $\frac{12}{0.8} = 15$.
23. (B) First, find the lowest common denominator. $\frac{2}{15} \times \frac{4}{4} = \frac{8}{60}$. $\frac{1}{12} = \frac{5}{60} = \frac{5}{60}$. $\frac{8}{60} + \frac{5}{60} = \frac{13}{60}$.
24. (B) The paperbacks cost $\$.35 \times 5$, or \$1.75. The hardcover books cost $\$2.50 \times 3$, or \$7.50. Together, they cost $\$1.75 + \7.50 , or \$9.25. Subtract that from \$10 to find the change: $\$10.00 - \$9.25 = \$0.75$.
25. (B) Military times greater than 1200 are times after noon.
26. (C) Don't get bogged down in the verbiage here; just do the math. A gross is 12 dozen. The farm sells 15×12 dozen eggs a week, or 180 dozen eggs, so 180 containers are needed.
27. (A) Multiply 90 by the decimal equivalent of 60%: $0.60 \times 90 = 54$.
28. (C) The calculation would look like this:

$$\begin{array}{r} 121 \text{ r}1 \\ 31 \overline{) 727} \\ \underline{6} \\ 12 \\ \underline{12} \\ 07 \\ \underline{6} \\ 1 \end{array}$$

29. (C) You need to multiply 15 minutes by the number of days in two weeks, 14: $15 \times 14 = 210$. 210 minutes is equal to 3 hours 30 minutes.
30. (B) Use the decimal equivalent: $0.35 \times 70 = 24.50$, or 24.5.
31. (C) Simply divide to find the decimal equivalent: $17 \div 5 = 3.4$. It should be clear from looking at the answer choices that only choice C makes sense.
32. (A) 1,000 milliliters = 1 liter, so 2,500 milliliters = 2.5 liters.
33. (B) Percentages are essentially ratios where the second number is 100. Divide 13 by 60 to find a decimal equivalent: $13 \div 60 = 0.2166666$, which rounds to 22%.
34. (C) If two cost 36 cents, one costs 18 cents, and 10 cost \$1.80. This should be easy enough to do in your head.
35. (1955) Reading from left to right, M = 1,000, CM = 900, L = 50, and V = 5, making the date 1955.
36. (D) You can do this algebraically or as a guess-and-check. Algebraically, Lulu = L, her sister = S, and their cousin = C. $L = S - 5$, and $S = C + 7$. Since $C = 15$, $S = 22$, and $L = 17$.
37. (C) Ordinarily, multiplying two numbers with two digits right of the decimal point would result in a product with four digits to the right of the decimal point. Here, however, the last digit, zero, is dropped off.
38. (B) Since you are multiplying a number with two digits after the decimal point by a number with one digit after the decimal point, the answer should have three digits after the decimal point.
39. (D) The formula is $C \times \frac{1}{5} + 32 = F$. $22 \times \frac{1}{5} + 32 = 71.6$.
40. (B) You can find the answer by setting up the easier of the two possible proportions: $\frac{1}{50} = \frac{10}{x}$, so $x = 500$ cm. Since 500 cm = 5 m, you should be able to rule out all of the choices but choice B.
41. (B) If they replace 14 in 7 hours, they work at a rate of about 2 per hour. They can do 120 in 60 hours, or two 30-hour weeks.
42. (C) The answer will be very close to 4.5 divided by 1, so the most reasonable answer (without computation) is choice C.
43. (C) Find the least common denominator and subtract: $\frac{8}{20} - \frac{5}{20} = \frac{3}{20}$.
44. (D) Think of this as a proportion: 1 hour/80 miles = x hours/140 miles. Cross-multiply to solve: $140 = 80x$; $x = \frac{140}{80}$, or 1.75 hours, which equals 1 hour 45 minutes.
45. (D) Express each mixed number as an improper fraction: $2\frac{1}{4} - 2\frac{3}{8}$. Then find the lowest common denominator and restate those fractions: $\frac{17}{8} - \frac{9}{8}$. Solve, and express as a mixed number in lowest terms: $\frac{8}{8} = 1\frac{8}{8} = 1\frac{1}{2}$.
46. (D) There are two simple ways to do this: divide 9 by 25, or recognize without computing that $\frac{9}{25} = \frac{36}{100}$.

47. (300) In other words, $0.35x = 105$. $105 \div 0.35 = 300$.
48. (C) Find 3% of \$36,055 and add that to Wallace's salary.
 $0.03 \times \$36,055 = \$1,081.65$. $\$36,055 + \$1,081.65 = \$37,136.65$.
49. (2) The key here is that everyone is retaining his or her job, so you are adding to the total. You can do this by guessing and checking. Right now, there are $\frac{5}{25}$ male nurses, or 20% of the nursing staff. If you add just 1 more male nurse, the total will be $\frac{6}{26}$ male nurses, or 23% of the nursing staff. Adding another brings you to $\frac{7}{27}$ male nurses or just more than 25% of the nursing staff. So adding a minimum of 2 staffers would solve your diversity problem—as long as both were male.
50. (D) There are 8 ounces in a cup and 32 ounces in 4 cups.

Biology

- (A) The mitochondrion is the organelle found in eukaryotes that supplies most of the cell's energy by manufacturing ATP.
- (B) ATP energizes glucose so that it can be broken down, and then the glucose molecules in the cytoplasm of the cell split in half, with each half of the six-carbon glucose becoming a three-carbon substance called pyruvic acid, releasing energy in the process in the form of ATP.
- (D) Mitosis is cell division that produces new cells with the same number of chromosomes as the original cell. Meiosis (choice A) is the type of cell division that produces cells with half of the organism's normal chromosome number.
- (A) RNA is ribonucleic acid; its sugar is ribose. DNA is deoxyribonucleic acid; its sugar is deoxyribose.
- (B) If the disease is carried on the dominant allele, only the *aa* combination of recessive genes represents a disease-free offspring. On a Punnett square, that would be one out of four offspring.
- (C) If cells are placed in a very salty solution, water molecules can diffuse across the cell membrane to move from an area of greater concentration of water molecules (inside the cells) to an area with a lesser concentration of water molecules (the solution of salt water).
- (A) Unlike many creatures, grasshoppers and other insects have a system in which blood circulates through blood vessels that open into spaces between their body organs. Carbon dioxide and oxygen are not exchanged through the blood but instead pass between the cells and the outside of the grasshopper through the tracheas and spiracles.
- (B) Enzymes are catalysts that speed up reactions. They do this by lowering the amount of energy needed to begin the reaction.