1. **D.** Simpify the expression. 3 • 8 ÷ 2 + 49 🡪 24 ÷ 2 + 49 = 61
2. **C.** 7 is in the tenths position
3. **D.** Cross multiply to get 60 = 3a. Divide. a = 20
4. **D.** The absolute value of -12 is 12
5. **C.** Multiply by the reciprocal = =
6. **E.** 0 is a whole number and an integer.
7. **C. ** can be simplified to 
8. **B.** Expanding the expression gets you . The coefficient for x is -3.
9. **B.** 7 = |x + 5| can be split in two different equations: 7 = x + 5 and -7 = x + 5. By solving these two equations, we get x = {-12, 2}.
10. **C.** Adding the list gets you a sum of 36. Diving by the 9 (the number of observations) calculates the mean, 4.
11. **D.** Add up the digits (excluding 3, 6, and 9). If that number is divisible by 3 then the number is divisible by three. 8+7+7+1+4+1 = 28. 28 is not divisible by 3.
12. **D.** Volume of a cube is one edge cubed.
13. **D.** In order for a number to be divisible by 12, they must be divisible by 3 and 4. To check divisibilty for 3, we can add the digits and check if they are a multiple of three. Using this technique, we can determine that the given number can only be a multiple if the last digit is 2, 5 or 8. To check for the divisibility of 4, the last two digits must be a multiple of 4. This only works is the last digit is 8.
14. **C.** Rational means that a number can be made into a fraction. . Pi cannot be made into a fraction.
15. **E**. Aidan is first, Andrew is second, TOMMY is third, Hannah may be fourth or fifth, and Amy will be in whichever place Hannah is not.

16. **D.** The numbers 2-99 can be cross-canceled on the numerator and denominator of the fractions. This leaves the fraction of . Therefore, *a* equals 100.

17. **A.** Set up the equation . Distributing 13, you get . Solving for *x,* you get .

18. **C.** This pattern is the Fibbonacci sequence. The continuation of the sequence is as follows: 21, 34, 55. 55 is the 10th number.

19. **C.** Using the formula for temperature conversion:.

20. **B.** Set up two equations: and . Solving for *x* yields 3.

21. **D.** The prime factorization of 84 is . We can take the exponents of each factor and one to them. Then, when we multiply these numbers together (), we get the number of factors (12). Alternatively, you could just list out the factors.

22. **A.** Plugging the function in and simplifying, we get Since 43 = 64, 2a = 3, and a=1.5.

23. **A.** Set up two equations:  and . Solving for g, we get 6.

24. **A.** Take 1.5, then move the decimal place to the left six times. The result is 0.0000015.

25. **A.** 500, 1200, 1300 is a variation of the 5, 12, 13 Pythagorean triple. Alternatively, you could use the Pythagorean Theorem: .

26. **E.** If the sum of two prime numbers is prime, one of the numbers must be 2. This is because all prime numbers greater than 2 are odd. Brandon’s number is less than Andrew’s, so it must be 2, as 2 is the smallest prime number.

27. **B.** Dividing the fractions out, we get . Simplifying gets us 16 = 6x, and solving for x gets us  .

28. **C.** If 20% percent of the boys have red ski boots, then 2 of them do. If 50% percent of the girls have red ski boots, then 10 of them do. 

29. **B.** Write in Slope-Intercept Form. y = 3x + 6. The slope of the line given is 3. To get the perpendicular slope, get the slope’s opposite reciprocal. In this case, the perpendicular slope is .

30. **B.** Multiplying the radicals out, we get 