1. **B** -
2. **A –** 5! = 5 · 4 · 3 ·2 · 1 = 120
3. **B** - % change
4. **E** - total distance , total time = total distance / speed
5. **A** - total volume
6. **B** - rounds of wool
7. **D** - total price
8. **C** - abscissa = values of x, adding up the equations yields 12 is the only positive value
9. **C** - Age of Yasmine = y, Age of Cheyenne = c, Age of Jack = j

From the question we get: Plugging in our first 2 equations into the third equation, we get:

1. **D** - slope
2. **E** - The prime numbers under 150 are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97. There are 25 prime numbers.
3. **D** - 
4. **D** - number of steam engines = number of crankshafts \* number of gears
5. **A** - 
6. **B** - surface area of a sphere =
7. **B** - Since the trains are traveling in opposite directions, the two trains can essentially be represented as one train traveling at 300 mph. The trains will take to reach each other. In 2.4 hours, the slower train will travel
8. **B** - Let S(n) denote the number of ways to sum to n with only 1’s and 2’s. Split this problem into two cases: case 1 - the sum ends with a 1, case 2 - the sum ends with a 2. In case 1, we can just find S(9) and add a 1 to the end of it. In case 2, we can just find S(8) and add a 2 to the end of it. So, we get S(10) = S(9) + S(8). This recursion can be traced all the way to the base case of S(3) = S(2) + S(1). We can just manually solve S(2) and S(1) which are just 2 and 1 respectively and work our way up. We get 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, so 89 is the answer.
9. **A** - We can find the largest possible number by assuming the other 4 to be as small as possible. This is just 2, 4, 6, 8 since all of the numbers must be distinct positive integers. If the average of the set of 5 numbers is 8, then the sum is just 40. Computing gives 20.
10. **D** - 0.7j + 0.2(44) = 0.5(j + 44) 🡪 0.7j + 8.8 = 0.5j + 22 🡪 0.2j = 13.2 🡪 j = 66
11. **C** - Let the sides perpendicular to the house be x. This means the side parallel to the house is 60 - 2x. We want to maximize . We can apply the vertex formula of to find the x value that maximizes the area of the plot. We get . When x = 15, the area is just .
12. **D** - The probability of someone having the disease and testing positive is 0.02(0.98). The probability of someone not having the disease and testing positive is 0.98(0.02). So, the probability of someone actually having the disease when testing positive is just 0.50.
13. **C** -
14. **C** - x=page #; x(x+1)=650 🡪 x2+x-650=0 🡪 (x+26)(x-25)=0 🡪 x=25 (-26 is extraneous) 🡪 25 + 26 = 51
15. **A** - f(x) must be a perfect square. Therefore, a = 3, which gives x2 - 6x + 9.
16. **E** - Working backwards, there are 3 remaining on the 29th and 9 remaining on the 28th, which isn’t an answer choice.
17. **B** - The 6 and 7 are switched in the parentheses making this an example of the commutative property.
18. **A** - 2x+3y=10 has slope -2/3. The slope of a line perpendicular to it is 3/2.
19. **C** - Add all the equations to get
20. **B** - 
21. **B** - 