



**SOLUTIONS**

*Math Challenge #11 has a mixture of math problems that you can solve using Draw a Model Strategy, Make an Equation, or Make an organized list. You have seen these types of problems from previous challenges.*

<i>Problems</i>	<i>Answer</i>
1. When I add two numbers together, they give me a sum of 22. If one of the numbers is 8, what is the other number?	<i>14</i>
2. A group of children are playing tag at the playground. Two boys and one girl join in and now there are 11 children playing tag. How many children were there before the two boys and the girl came and joined them?	<i>8</i>
3. Brad likes to climb trees. On Monday, he climbed 6 more trees than on Tuesday. On Tuesday, he climbed 5 trees. On Wednesday, he climbed 7 fewer trees than on Monday. How many trees did he climb on Wednesday?	<i>4</i>
4. Use the digits 2, 4, 6, 7 to make this a true statement: $\begin{array}{r} \square \square \\ + \square \square \\ \hline 100 \end{array}$	<i>26 + 74 or 24 + 76 (either order)</i>
5. Dario wrote a story about dinosaurs. The story had 325 words. When he edited the story, he deleted 36 words and added 82 new words. How many words are in the story now?	<i>371 [words]</i>
6. The oil drillers drilled 18 meters in the first well but did not find oil. They drilled 6 more meters and found oil. To reach oil in the second well they had to drill twice as deep. How far did they drill the second well? <i>(18+6) × 2 = 48 meters</i>	<i>48 [meters]</i>
7. Each of the 6 teachers at Apple Valley School has 21 students. Next week, 9 students are moving away. After they move, how many students will be left? <i>6×21 = 126 students, 126 – 9 = 117 students</i>	<i>117 [students]</i>
8. Mrs. Lee baked 219 cookies for a bake sale. She packed them into as many large bags as possible of 10 cookies. She also packed some small bags of 4 cookies. a) How many large bags and how many small bags did she pack? b) How many cookies were left unpacked? <i>219 – 9 = 210, so there are 21 big bags with 10 cookies each, 2 small bags with 4 cookies and 1 leftover</i>	<i>a. 21 [big bags] and 2 [small bags] b. 1 [cookies leftover]</i>
9. The Carolina Dynamos played 125 soccer games. They won 15 more games than they lost. How many games did they win? $\left. \begin{array}{l} \text{Lost } \square \\ \text{Win } \square + 15 \end{array} \right\} 125$ <i>(125-15) ÷ 2 = 55 games lost 55+15 = 70 games won</i>	<i>70 [games]</i>

10. My snack bag contains 32 nuts - only pecans, walnuts, and peanuts. There are twice as many walnuts as pecans. There are 2 more peanuts than walnuts. Exactly how many nuts of each kind are in my snack bag?

Pecans

Walnuts

Peanuts

} 32

$32 - 2 = 30$  nuts in 5 identical blocks  
 $30 \div 5 = 6$  pecans,  $6 \times 2 = 12$  walnuts,  $12 + 2 = 14$  peanuts

*6 pecans, 12 walnuts, and 14 peanuts*

11. *The Lost Kids Musical* opened at the school theater on Monday. The 1<sup>st</sup> day there were 35 people who saw the musical. They told their friends and on the 2<sup>nd</sup> day 16 more people came than on the 1<sup>st</sup> day, so that 86 people had seen the musical after the 2<sup>nd</sup> day. On the 3<sup>rd</sup> day 67 people came, 16 more than on the 2<sup>nd</sup> day. If each day 16 more people saw the musical than the day before, on what day would 700 people have seen the musical?

*Hint: Make an organized list*

Day	1	2	3	4	5	6	7	8
People that day	35	51	67	83	99	115	131	147
Total number of people	35	35+51= 86	67+86= 153	236	335	450	581	728

*The 8<sup>th</sup> day or day 8*

12. Which three consecutive *even* numbers have a sum of 204?

1<sup>st</sup>

2<sup>nd</sup>

3<sup>rd</sup>

} 204

$204 - (2 + 4) = 198$   
 $198 \div 3 = 66$  is the first number  
 $66 + 2 = 68$  2<sup>nd</sup> number  
 $68 + 2 = 70$  3<sup>rd</sup> number

*66, 68, 70*

13. Farmer Joe planned to sell the eight turkeys he raised this year at the Woodinville County Fair. He recorded the weight of each turkey to the nearest whole number. He noted the following:

- None of the turkeys had the same weight.
- The mean weight was 33.75 pounds.
- The median weight was 33 pounds.
- The range of the weights was 26 pounds.

According to the county regulations, farmer Joe would not be permitted to sell two of his turkeys at the Fair. One turkey weighed less than the minimum weight of 25 pounds, and the other turkey weighed more than the maximum weight of 40 pounds. After excluding the two turkeys, farmer Joe noted the following:

- The mean weight and the median weight is the same, which was 33 pounds.
- The range of the weights was 15 pounds.

Based on the information provided, what was the combined weight of the two turkeys that had to be excluded?

*The combined weight of the eight turkeys was  $33.75 \times 8 = 270$  pounds. After the turkeys weighing the least and the most were excluded, the mean weight was 33 pounds, so the combined weight of the six turkeys was  $33 \times 6 = 198$  pounds. The combined weight of the two excluded turkeys is the difference between these two total weights. Therefore, the combined weight of the two turkeys that had to be excluded was  $270 - 198 = 72$  pounds.*

*72 [pounds]*

14. The outdoor club of 24 students at Fremont High School decided to go on a camping trip. They bought enough food to last 20 days. If 16 additional students decided to join them at the last minute, how many days will their food last?

Students	Days
24	20
1	$24 \times 20 = 480$ for 1 student enough food for 480 days
$24 + 16 = 40$	$480 \div 40 = 12$

*12 [days]*

15. Jonah earned \$576 during the month of February. He was paid \$6 per hour. He did not work more than five hours each day, nor did he work on Sunday. If he worked the same number of hours each day, how many hours per day did he work?

*Jonah worked: \$576 divided by \$6 indicates = 96 hours. February has 28 or 29 days, minus 4 Sundays, it could be 24-25 working days. He was working 5 or less hours per day. The only factors of 96 that work are 4 x 24. Thus, he worked 24 days for 4 hours.*

*4 [hours]*

16. A zookeeper is ordering food for the zebras. She knows that three zebras eat 25 pounds of hay every three days. How much hay should she order for 12 zebras to have enough hay for 30 days?

Zebras	Pounds of Hay	Days
3	25	3
3	$25 \times 10 = 250$	$3 \times 10 = 30$
$3 \times 4 = 12$	$250 \times 4 = 1000$	30

*1000 [pounds]*

17. In a game, a code made using different colors created by a player (the code-maker), and the other player (the code-breaker) tries to guess the code. The code-maker gives hints about whether the colors are correct and in the right position. The possible colors are Blue, Yellow, White, Red, Orange, and Green. How many 4-color codes can be made by the code-maker if the colors cannot be repeated?

*The code has 4 positions: \_\_\_ \_ \_ \_ . On the first position any color can be used, on the next position it could be any color, except what was used earlier, and so on. \_\_\_ \_ \_ \_*

*6 × 5 × 4 × 3 = 360 possible 4-color codes.*

*360 [color codes]*

18. Eleven students put their names on slips of paper inside a box. Three names are going to be picked. How many ways can the three names be chosen if the order of the names doesn't matter?

Whether the names picked are Abby, Bella, and Charlie or Charlie, Abby, and Bella, this will be counted as one way.

*We need to pick 3 names out of 11. So, there are \_\_\_ \_ \_ (three places/things). On the first place it could be any of 11 names, then 10, then 9. Therefore, there are  $11 \times 10 \times 9 = 990$  ways. Because in this case the order does not matter, when we picked 3 names we can rearrange them in 6 different ways. So, the final number of ways is  $990 \div 6 = 165$*

*Or notice that it is a combination problem where the order of picking those three names does **not** matter.*

$${}_{11}C_3 = \frac{11!}{3!(11-3)!} = \frac{11 \times 10 \times 9 \times 8!}{3 \times 2 \times 1 \times 8!} = \frac{11 \times 10 \times 9}{3 \times 2 \times 1} = \frac{990}{6} = 165 \text{ ways}$$

*165 [ways]*

*Solution is available on 3/16/18 at [www.mathinaction.org](http://www.mathinaction.org)*