

1. Oranges

2 oranges

2. Arithmetic

$$5 \times (4 + 9/3)$$

3. Bugs

1:30pm

4. Festival

$$(X) + (Y) = 1097$$

$$(5X) + (10Y) = 6800$$

$$X + (2Y) = 6800 / 5 = 1360$$

$$2Y = 1360 - X$$

$$Y = (1360 - X) / 2$$

$$X + ((1360 - X) / 2) = 1097$$

$$2X + 1360 - X = 2194$$

$$2X - X = 2194 - 1360 = 834$$

$$X = 834$$

$$Y = 1097 - 834 = 263$$

5. Office Space

Name plate Color	Developer	Language	Team Members	Team
Yellow	Jason	C++	1	Batch
Blue	Jacob	Java	3	Part Search
Red	Tim	C#	2	Web Services
Green	Kevin	SQL	5	Business Systems
White	Jay	C	4	BuildMaster

6. Dice

10 is the score for the first roll.

15 is the score for the second roll.

9 is the score for the third roll.

20 is the score for the fourth roll.

12 is the score for the fifth roll.

7. Trains

Since the trains are 100 miles apart, and the trains are traveling toward each other at 40 and 60 mph, the trains will collide in one hour. The bird will have been flying for an hour at 90 miles per hour at that point, so the **bird will have traveled 90 miles.**

8. Squeegies

Let a be the number of red squeegies you buy. Let b be the number of yellow squeegies you buy. Let c be the number of blue squeegies you buy. We know two equations:

$$\begin{aligned}a + b + c &= 100 \\ 6a + 3b + 0.1c &= 100\end{aligned}$$

By multiplying the first equation by 6 and then 3, then subtracting these two equations from the second, we can come up with two more equations:

$$\begin{aligned}6a + 6b + 6c &= 600 \\ 3a + 3b + 3c &= 300 \\ 3b &= 500 - 5.9c \\ 3a &= 2.9c - 200\end{aligned}$$

Normally, two equations isn't enough to solve for three variables. But we know that a and b are nonnegative integers. So, if $3b \geq 0$, then $500 - 5.9c \geq 0$. This means $c \leq 84.75$. Also, if $3a \geq 0$, then $2.9c - 200 \geq 0$. This means $c \geq 68.97$.

However, since buying blue squeegies is the only way to spend a fraction of a dollar, the number of blue squeegies we buy must cost an even dollar amount. The only two numbers of blue squeegies we can buy between 68.97 and 84.75 that satisfy this condition are 70 and 80.

If we substitute 80 for c in the last two equations listed above, we can solve for a , which equals 10.67, and b , which equals 9.33. But the values of a and b must be integers, so we know this is not the solution.

If we substitute 70 for c in the last two equations listed above, we can solve for a , which equals 1, and b , which equals 29.

So one red squeegie must be bought for \$6.00, 29 yellow squeegies must be bought for \$87.00, and 70 blue squeegies must be bought for \$7.00.

9. Vacation

Alternate Solution #1

Let s be the total distance of the journey to the hotel. Let v be walking speed. So $2v$ is the bike's speed, and $8v$ is the train's speed. Let I be the time it took for Isaac to complete the journey, and A be the time it took for Albert to complete the journey. Since distance equals rate times time, we have two equations, one for I and one for A :

$$I = (s/2)/8v + (s/2)/v = s/16v + s/2v$$

$$A = s/2v$$

Note that I exceeds A by $s/16v$. Albert will reach the hotel first.

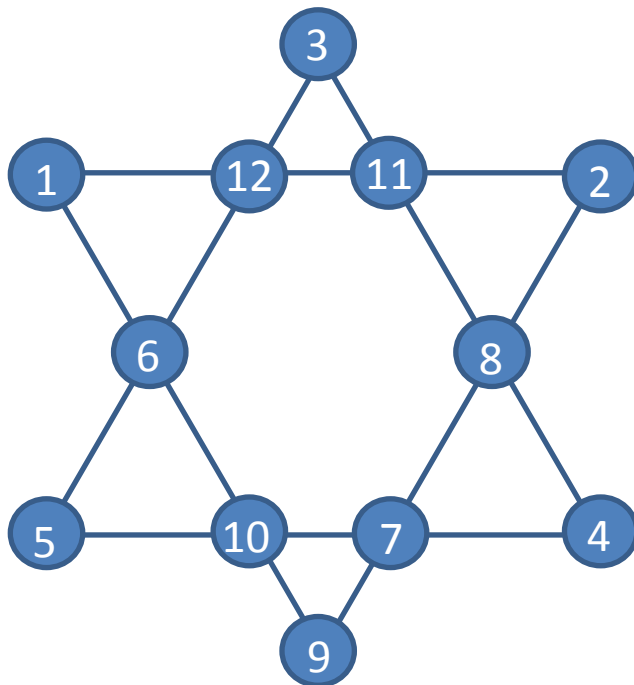
Alternate Solution #2

The problem may be solved more easily with simple logic. If the bicycle is twice as fast as walking, the time it takes to bike the whole way is equal to the time it takes to walk half the way. So if the train's speed is anything shy of infinite, biking will still be faster.

10. Doughnuts

Two. Weigh three of the doughnuts against three others and leave the remaining two on the table. If the scales are even, the heavy doughnut is one of the two on the table -- weigh them to find out. If the scales are uneven, take the three doughnuts on the heavy end, weigh one of them against another, and leave the third on the table. If the scales are uneven, you've found the heavy one. If not, the heavy one is the one on the table.

11. Star of David



12. Farmer Bob

2000 Bushels

13. First and Second

$$10! / (10-2)! = 10! / 8! = 3,628,800 / 40,320 = 90$$

14. Shift in Time

$$12! / 8! = 11880$$

15. Photographer

White

16. Rectangle

10cm and 7cm.

$$S_1 + 18 = S_2 \Rightarrow x(x-3) + 18 = (x+1)(x-2) \Rightarrow x^2 - 3x + 18 = x^2 + x - 2x - 2 \Rightarrow 2x = 20 \Rightarrow x = 10$$

$$x - 3 = 7$$

17. \$80

\$17, \$34, and \$29

18. Kurt's Perfect Anniversary

229

19. Jeb Loves Sheep

60

20. The Fives Have It

-156°C_{Tungsten}

21. Math Puzzle

27 You assume that $5 = 4.5$ since it is half of 9. So 6 times $4.5 = 27$.

22. Logic Poem

Fruit

23. Puzzle Solving

Yes.

There are only 2 puzzles being spoken of: this one, and the one before this one. The entire question could be rephrased like this: If the puzzle you solved before this one was harder than this one, was the puzzle you solved before this one harder than this one?

24. Word Problems

"Herein." The words it contains are: "he," "her," "here," "ere," "re," "rein," "I," and "in."

25. Day Before Yesterday

Dec. 31