Do not spend too much time on any one question. You can skip and come back. Remember to put labels where appropriate. Express all fractions in simplest form.

Enjoy!

1. Cookies are sold singly or in packages of 2 or 6. With this packaging, how many ways can you buy a 10 cookies?

2. To decrease the area of a circle by 75%, I must decrease its radius by ___?

3. My current age will be tripled 16 years after it is doubled. What is my current age?

4. We walked the same path up a hill, then down, with no break. We began at 3:15 PM and finished at 4:30 PM. We walked the downhill part twice as fast as the uphill part.   What time did we begin to walk downhill?

5. What percent of 60 is 20% of 30?

6. I rode 24 km in 3 hrs. Sam went twice as far in half the time. What was his rate?

7. After the first four tests of the year, Laura had an average score of 75. After the first 5, her average was 80. What was her score on the 5th test?

8. Express 45^3 as a product of primes.

9. The square of the reciprocal of my favorite whole number is $\frac{1}{9}$. What is the cube of my favorite whole number?

10. Of 180 painting, 110 have blue borders and 90 have red borders. If 25 paintings have neither color border, how many have both colors?

11. What is the least common multiple of 11, 22, 33, and 44?

12. What time is half as many minutes after 8:15 AM as before 3:45 PM?

13. If $\left(\dfrac{a}{b}\right)^{-c}$ equals $\left(\dfrac{b}{a}\right)^{cd}$ then $\left(\dfrac{2}{3}\right)^{-4}$ equals ? (Express your answer as a number without exponents).

14. $(3y^3 \cdot y \cdot 2)^3$

15. The number that is 5 less than the square root of 144 is 5 more than the square root of ---?

16. An equilateral triangle and a square have the same perimeter. If the length of a side of the triangle is 8, what is the area of the square?

17. $(-4)^2 \, (-3)^0 \, (-2)^1 \, (-1)^0$

18. If Al can paint a house in 6 hours and Pete can paint the same house in 7 hours, how long will it take to paint the house if the two work together?

19. My teacher's blackboard is in the shape of a rectangle. I add its area to its perimeter, then subtract twice its length, then divide by the width, then subtract 2 from the quotient. The result is the rectangle's _____.

20. If $\dfrac{x}{y} = \dfrac{2}{9}$ and $\dfrac{z}{y} = \dfrac{4}{5}$ then $\dfrac{x}{z} = ?$

21. In three years, Chad will be three times my present age. I will then be half as old as he. How old am I now?

22. One night the King couldn't sleep, so he went down into the Royal kitchen, where he found a bowl full of mangoes. Being hungry, he took 1/6 of the mangoes.

Later that same night, the Queen was hungry and couldn't sleep. She, too, found the mangoes and took 1/5 of what the King had left.

Still later, the first Prince awoke, went to the kitchen, and ate 1/4 of the remaining mangoes.

Even later, his brother, the second Prince, ate 1/3 of what was then left.

Finally, the third Prince ate 1/2 of what was left, leaving only three mangoes for the servants.

How many mangoes were originally in the bowl?

23. Two balls A and B rotate along a circular track. Ball A makes 2 full rotations in 26 minutes. Ball B makes 5 full rotation in 35 minutes. If they start rotating now from the same point, when will they be at the same starting point again?

24. Find an equation of the line containing (- 4, 5) and perpendicular to the line 5x - 3y = 4.

25. One pump fills a tank two times as fast as another pump. If the pumps work together they fill the tank in 18 minutes. How long does it take each pump working alone to fill the tank?

 Bonus (to be used only in case of a tie)

1.   The numbers x, y, z and w have an average of 25. The average of x, y, and z is 27. Find w.

2. Find the dimensions of a rectangle that has a length 3 meters more than its width and a perimeter with a value equal to its area.

3.   A has the coordinates (2, 2). What are the coordinates of its image point if it is translated 2 units up and 5 units to the left, and reflected in the x axis?

4.   In a certain college 40% of the senior class students is taking physics, 30% calculus, and 10% are taking both. If the senior class is 40 students how many are taking neither physics nor calculus?