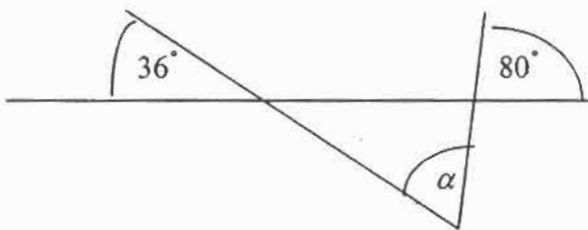


1. Find: $1 + 2 + 4 + 8 + \dots + 512 =$ _____ 1

2. Find: $\frac{\frac{13}{33} - \frac{1}{11}}{\frac{16}{33}} \times \frac{16}{23} =$ _____ 2

3. Find the angle α . _____ 3



4. What is the remainder when $1 \times 2 \times 3 \times \dots \times 10 \times 11 + 3^2$ is divided by 7? _____ 4

5. What is the product of all the prime factors of 120? _____ 5

6. Find the value of: $(77 \times 7) + (11 \times 7) + (22 \times 7) =$ _____ 6

7. Three workers need 15 hours to finish a job. How many hours are needed for five workers to finish the same job if they work at the same speed? _____ 7

8. $\frac{x}{y} = 2.5$ and $\frac{x+y}{x-y} = 2\frac{8}{z}$. What is the value of z ? _____ 8

9. On a planet far away, the year is 600 days long, and weeks are still 7 days long with the same names for each day of the week as on planet Earth. On one year, New Year's day was on Sunday. On what day of the week was the next New Year's day? _____ 9

10. What is $\frac{a}{b} \times (a \times b) \times \frac{9}{b}$ when $a = 7$ and $b = 3$? _____ 10

11. There are eleven teams in a basketball tournament. Each team must play all other teams exactly twice. How many games need to be played in this tournament? _____ 11

12. Joe runs at a rate of 5 meters/sec. Jane runs at a rate of 8 meters/sec. If Joe and Jane have a race and Jane starts 160 meters from the finish line, how far ahead of Jane should Joe start (in meters) so they both reach the finish line at the same time? _____ 12

13. Calculate: $19 + 78 + 80 + 21 + 82 + 17 =$ _____ 13

14. The base of a pyramid has 6 sides.
How many vertices does the pyramid have? _____ 14
15. A number N has the form $323232\dots32$ and is divisible by 9.
What is the smallest number of digits that N can have? _____ 15
16. What is the sum of the first 2004 terms
of the sequence $0,1,2,0,1,2,0,1,2,\dots$? _____ 16
17. $a, b,$ and $c,$ the lengths of the sides of the triangle $ABC,$ are whole numbers.
We know that $a = 7$ and that $b = 11.$
What is the minimum possible value of c ? _____ 17
18. Find the value of the expression: $\sqrt{17^2 - 15^2} - (\sqrt{17^2} - \sqrt{15^2}) =$ _____ 18
19. There are 31 students in a classroom. Of these students, 16 are girls.
7 of the students have pierced ears. If 12 of the boys do not have
pierced ears, how many of the girls have pierced ears? _____ 19
20. The circumference of a circle and the perimeter of a pentagon can
intersect at a maximum of N points. What is N ? _____ 20
21. What is the smallest even whole number
the sum of whose decimal digits is 33? _____ 21
22. A pot full of water weighs 2 kg (the total combined weight of the pot and
the water). If we spill out 20% of the water, the weight of the pot and the
water together is 88% of the original weight. What is the weight of the
empty pot in kg? (Give your answer as a decimal expression). _____ 22
23. A farmer has only chickens and cows. If you count the legs of the chickens
(two legs each) and the legs of the cows (four legs each), there are a total
of 720 legs altogether. Also, there are 4 times as many cows as there are
chickens. How many cows are there on the farm? _____ 23
24. Define a new operation "&". For X, Y any two numbers, $X \& Y = \frac{X}{X+Y}$.
Suppose that $X \& Y = \frac{1}{3}$. Find the value of $Y \& X$. _____ 24
25. Sheila can fill her backpack, without leaving any wasted space, with
(a) 4 video cassettes and 21 DVDs, or (b) 3 binders and 4 video cassettes,
or (c) 5 binders. If she fills her backpack with DVDs only,
how many DVDs can she fit in her backpack? _____ 25