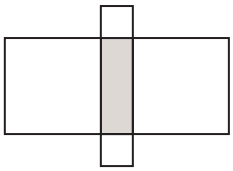
Blitz, Page 1

1. In the figure below, the shaded region is a rectangle with base 1 cm and height 3 cm. An outward-facing square has been erected on each side of the rectangle. What is the area of the entire figure (including both the shaded part and the unshaded part)?



1. _____ cm^2

2. A fair coin is flipped 6 times. What is the probability of getting 6 heads in a row? Express your answer as a common fraction.

2. _____

3. What is three-quarters of one-third of two-sevenths? Express your answer as a common fraction.

3. _____

4. What is the value of $\dfrac{10^6}{20^3}$?

4. _____

5. What is the (positive) value of $\sqrt{x^3 + y^2}$ when $x = 6$ and $y = 3$?

5. _____

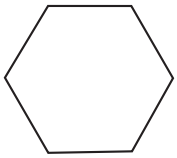
6. Today is Saturday. What day of the week was it 1000 days ago?

6. _____

7. A special breed of cow produces 25% more milk per year than a regular cow, but it needs to eat 20% more grain. A farmer replaces her regular cows with special breed cows. How many percent less grain do the special breed cows eat per litre of milk produced?

7. _____ %

8. The figure below is a regular hexagon. Each side has length 2 cm. What is the area of the hexagon? Express the answer in simplest radical form.



8. _____ cm^2

9. At the instant that it is midnight in Vancouver, it is 4:30 am in St. John's, Newfoundland. An airplane left Vancouver at 10:00 am (Vancouver time) and flew directly to St. John's. The total flight time was 7 hours and 50 minutes. What time was it in St. John's when the plane arrived? Express your answer in the usual hours:minutes format, as in 6:25.

9. _____ pm

10. A house and a garage are built on a rectangular lot that is 33 feet by 120 feet. The house occupies 1500 square feet of the lot, the garage occupies an additional 360 square feet, and the rest of the lot is lawn. What is the area of the lawn, in square feet?

10. _____ feet^2

11. Beti has 40% more money than Alfie. Between them they have \$1800. How many dollars does Alfie have?

11. _____ dollars

12. On a farm that has genetically engineered animals, chickens have 1 head and 3 feet, and rabbits have 1 head and 5 feet. These are the only animals on the farm. Altogether, the animals on the farm have 90 heads and 310 feet. How many chickens are on the farm?

12. _____ chickens

13. Richie went to the bank to cash a \$2000 cheque. He got an equal number of 10 dollar bills, 20 dollar bills, and 50 dollar bills. How many bills did Richie get altogether?

13. _____ bills

14. How many points are there, both of whose coordinates are integers, on the boundary of the rectangle whose corners are $(-20, 5)$, $(20, 5)$, $(20, 35)$, and $(-20, 35)$?

14. _____ points

15. Suppose that

$$a+b=12, \quad b+c=13, \quad c+d=14, \quad \text{and} \quad a+2d=14.$$

What is the value of a?

15. _____

16. Let x and y be real numbers such that $x^{10}=11$ and $y^{20}=100$. What is the value of $x^{20}\times y^{10}$?

16. _____

17. A multiple choice quiz has 12 easy questions, worth 5 marks each, and 5 harder questions, worth 8 marks each. On any question, the only possible mark is 0 or full marks. Alfie's mark was 54. What is the *total* number of questions that Alfie answered correctly?

17. _____ questions

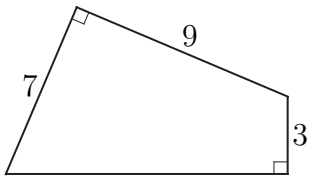
18. An integer N is chosen at random from the integers in the interval from 1 to 30, inclusive. What is the probability that N is a factor of 30? Express your answer as a common fraction.

18. _____

19. Alicia went on a 40 km bicycle ride. The first 20 km segment took 1 hour. On the last 20 km she rode 4 km per hour faster than on the first 20 km. How many minutes did the whole ride take?

19. _____ minutes

20. The picture below represents a quadrilateral with two opposite right angles. If three of the sides have lengths as shown in the picture, what is the area of the quadrilateral?

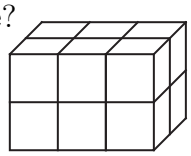


20. _____ units^2

21. Suppose that $x = 1 - \frac{1}{2} + \frac{1}{4} - \frac{1}{8} + \frac{1}{16} - \frac{1}{32} + \frac{1}{64} - \frac{1}{128}$. What is the value of $128x$? 21. _____

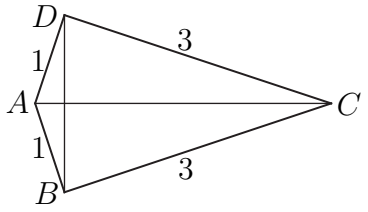
22. The product of 5 consecutive positive integers is divisible by 1120. What is the smallest possible value of the sum of the 5 consecutive integers? 22. _____

23. Twelve white unit cubes are assembled to make a $3 \times 2 \times 2$ rectangular prism. The outside surface of this prism is painted blue. Then the prism is disassembled into the original 12 unit cubes, and one of these cubes chosen at random is tossed like a die. What is the probability that the cube lands with the "up" face painted blue? 23. _____



24. A math contest has 38 questions, of which the first 26 are worth 1 point each, and the last 12 are worth 2 points each. (So the maximum possible mark for the entire contest is 50.) There is no partial credit on any question. A certain number N of students participated. Their average score on the first 26 questions was 20 (out of 26), and their average final score was 34 (out of 50). The total combined number of questions that were answered correctly was 621. What is the value of N ? 24. _____ students

25. In the kite below, $AB = AD = 1$ cm and $CB = CD = 3$ cm. Angles ABC and ADC are right angles. Express the area of triangle ABD as a common fraction. 25. _____ cm^2



26. In a certain type of game, B beats A 60% of the time, C beats B 60% of the time, and A always beats C. Player A played against B, and then the winner played against C. Given that C lost that game, what is the probability that C played against A? Write your answer as a common fraction. 26. _____