

REGIONAL 2009 FACE-OFF QUESTIONS
ACTUALLY USED

1. Simplify: $\frac{66}{0.12}$

1. 550

2. In the 4×4 grid below, every grid point is 1 unit from its nearest horizontal or vertical neighbours. How many different lines pass through the grid point P at the lower left-hand corner of the grid, and through at least one other grid point?

2. 9 (lines)



3. Alicia has \$1000 in her wallet. Half of the money is in \$20 bills, and the other half is in \$50 bills. How many bills does she have in her wallet?

3. 35 (bills)

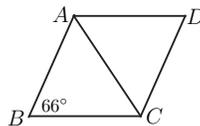
4. What is the mean, to 2 decimal places, of the following list of 8 numbers?

4. 2.25

2, 2, 2, 2, 2, 2, 3, 3

5. Quadrilateral $ABCD$ is a rhombus, and the degree measure of $\angle ABC$ is 66° . What is the degree measure of $\angle DAC$?

5. 57 (degrees)



6. Two standard dice are tossed. What is the probability that the product of the two numbers obtained is even? Express your answer as a common fraction.

6. $\frac{3}{4}$

7. What is the sum of the solutions of the equation $(x-3)(x^2-4) = 0$?

7. 3

8. TicketScalper[®] is selling single tickets to the concert for \$95 each, and booklets of 5 tickets for \$449. Five friends decide to get a booklet and share the cost equally. How much money does *each* of them save over the single ticket price? Give the answer in dollars, to the nearest cent. 8. 5.20 (dollars)
9. If $x + 2y + 3 = \frac{3}{5}$, what is the value of $2x + 4y + 5$? 9. $\frac{1}{5}$
10. What is the product of 10.5 and 30.5? Give your answer as a decimal correct to 2 decimal places. 10. 320.25
11. In a class of 50 students, there are 20 boys and 30 girls. Each boy was asked to write down the number of boys in the class (including himself). Each girl was asked to write down the number of girls in the class, including herself. They all wrote down the correct numbers. What is the average (mean) of all the numbers they wrote down? 11. 26
12. The product of 3 consecutive positive integers, divided by their sum, is equal to 40. Of the 3 consecutive integers, which integer is in the middle? 12. 11
13. What is the number of cm in the height of a cone which has the same base and the same volume as a cylinder of height 15 cm? 13. 45 (cm)
14. We have 64 little cubes, each of which is $1 \times 1 \times 1$. They completely fill a lidless $4 \times 4 \times 4$ cubical box. How many of the little cubes touch a side or the bottom of the big box? 14. 52 (cubes)
15. Alicia started studying at 6:50 PM, and stopped studying 3 hours and 20 minutes later. At what time did she stop studying? 15. 10:10 or equivalent

16. A drawer contains 9 blue marbles, 7 white marbles, and 5 red marbles. What is the smallest number of marbles that we must take out to make sure that among the marbles we take out all 3 colours are represented?

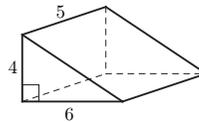
16. 17 (marbles)

17. The product of 3 consecutive even integers is equal to 960. What is the sum of these 3 even integers?

17. 30

18. A wedge of cheese has dimensions (in cm) shown below. (Technically, the wedge is a right triangular prism. The triangular faces of the prism are right triangles with legs of length 4 cm and 6 cm.) What is the volume, in cm^3 , of the wedge of cheese?

18. $60 \text{ (cm}^3\text{)}$



19. There are 14 yellow, 15 black, and 16 red jelly beans in a bowl, and no others. If you pick a jelly bean at random from the bowl, what is the probability it is not black? Express your answer as a common fraction.

19. $\frac{2}{3}$

20. What is the remainder when 2009 is divided by 18?

20. 11

21. A mother weighs 14 times as much as either one of her two identical twin babies. Altogether, the mother and the two babies weigh 72 kg. How many kg does the mother weigh?

21. 63 (kg)

22. The two legs of a right angled triangle have lengths 1 and 2.4. What is the length of the hypotenuse? Express your answer as a decimal, correct to 1 decimal place.

22. 2.6 (units)

- 23.** A full *small* (cylindrical) tomato paste can contains 156 ml of tomato paste. A *large* can has twice the radius and twice the height of a small can. How many ml of tomato paste does a full large can contain? 23. 1248 (ml)
- 24.** Let N be the five-digit number whose digits, from left to right, are 7, d , 8, d , and 5. If N is a multiple of 9, what is the value of d ? 24. 8
- 25.** There were 4 candidates for Mayor. Alicia got 50% of the votes, Beti got 30% of the votes, Gamay got 16%, and Delbert got the remaining 100 votes. How many people voted for Alicia? 25. 1250 (people)
- 26.** There are 2 different numbers each of which is twice as far from 0 as it is from 6. What is the sum of these 2 numbers? 26. 16



- 27.** One cubic centimetre of red cedar weighs 0.38 grams. What is the weight, in kilograms, of 1 cubic metre of red cedar? 27. 380 (kg)
- 28.** What is the smallest positive integer which is divisible by 30 and in whose decimal representation no digits occur other than 0 or 1? 28. 1110
- 29.** The area of an equilateral triangle is $9\sqrt{3}$ cm². What is the number of cm in a side of the triangle? 29. 6 (cm)
- 30.** Alicia has 1 five-dollar bill and 5 twenty-dollar bills. How many different sums of money can she make using 1 or more of these bills? 30. 11 (sums)
- 31.** What is the sum of the x -coordinate and the y -coordinate of the point where the line $y = 2x$ meets the line $y = 7x - 30$? 31. 18
- 32.** Define the function $f(x, y, z)$ by 32. 1

$$f(x, y, z) = \frac{xy + yz + zx}{x^2 + y^2 + z^2}.$$

What is the value of $f(7, 7, 7)$?