Regional 2012 Face-off
Questions and Answers

1. Evaluate $44 + 144 + 244$.
1. Answer: 432

2. What is the sum of all the primes that are smaller than 15?
2. Answer: 41

3. A rectangular box has volume 196000 cm^2 and a square base. If the height of the box is 40 cm, what is the number of cm in one side of the base?
3. Answer: 70 (cm)

4. What is the value of the sum

$$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15?$$

(Each term is 2 more than the previous one.)
4. Answer: 64

5. What is value of the smallest integer which is the sum of four distinct 2-digit primes?
5. Answer: 60

6. If $5x + y = 81$ and $5x - y = 69$, what is the value of x?
6. Answer: 15

7. The hypotenuse of a right-angled triangle has length 17, and one of the legs has length 8. What is the perimeter of the triangle?
7. Answer: 40

8. What is 250% of 2012?
8. Answer: 5030

9. An accurate 12-hour clock shows that it is exactly 12 : 00. What time shows on the clock 2012 minutes later? An answer like 4 : 17 or "four seventeen" is of the right shape.
9. Answer: 9 : 32

10. What is the value of $\frac{4^8}{8^4}$?
10. Answer: 16

11. The triangle below is isosceles. Each of the two smaller angles is one-eighth of the largest angle. How many degrees are in the measure of the largest angle?

11. Answer: 144 (degrees)

12. A high school runner ran 3000 metres in 9 minutes. What was the runner's average speed in kilometres per hour?
12. Answer: 20 (km/hr)

13. What is the value of $(31 \times 41) - (31 + 41)$?
13. Answer: 1199

14. What is the area of the triangle whose vertices have coordinates $(-2, 0)$, $(2, 0)$, and $(7, 11)$?
14. Answer: 22

15. Evaluate $(23 \times 8) + (8 \times 14) + (13 \times 8)$?
15. Answer: 400

16. Ten years from now, the sum of the ages of the 30 people in the class will be 725 years. What will the sum of their ages be 5 years from now?
16. Answer: 575 (years)

17. Express $\dfrac{1+2+3+4+5}{1 \times 2 \times 3 \times 4 \times 5}$ as a common fraction. .
17. Answer: $\dfrac{1}{8}$

18. The product of two numbers is 210, and the sum of the two numbers is 29. What is the positive difference between the two numbers? .
18. Answer: 1

19. Evaluate $5^5 - 55^2$.
19. Answer: 100

20. What is the smallest positive integer which is divisible by all of 20, 24, 25, and 30?
20. Answer: 600

21. Express $\frac{4}{3} - \left(1 + \frac{1}{4} + \frac{1}{16}\right)$ as a common fraction.

21. Answer: $\frac{1}{48}$

22. Alicia drives 1 kilometre in 32 seconds. At this rate, how many km does she drive in 10 seconds? Express the answer as a decimal, *rounded* to the nearest hundredth of a km.

22. Answer: 0.31 (km)

23. For what value of x is $1^3 - 2^3 + 3^3 - x = 0$?

23. Answer: 20

24. Alicia sold her condo for 20% more than she paid for it, and made a gross profit of $90,000$ dollars. For how many dollars did she sell her condo?

24. Answer: $540,000$ (dollars)

25. What is the value of 95×95??

25. Answer: 9025 (years)

26. The sides of a rectangle are integers, and the perimeter of the rectangle is 42. What is the largest possible area of the rectangle?

26. Answer: 110 (years)

27. Three fair dice are tossed. What is the probability that the sum of the numbers obtained is equal to 4? Express the answer as a common fraction.

27. Answer: $\frac{1}{72}$

28. What is the product of the greatest common factor and the least common multiple of 15 and 48?

28. Answer: 720

29. How many integers n are there such that $\frac{11}{n} > \frac{9}{7}$.

29. Answer: 8 (values)

30. What is the smallest number of times that you must throw a fair coin to have probability of 80% or more of getting at least one head?

30. Answer: 3 (times)

31. What is the value of $\dfrac{(6!)(7!)}{8!}$?

31. Answer: 90

32. How many two-digit prime numbers are there that use two distinct digits chosen from $\{1, 2, 3, 4, 5, 6\}$?

32. Answer: 7 (primes)

33. What is the mean of the first 10 terms of the arithmetic sequence 1, 11, 21, 31, . . . ?

33. Answer: 46