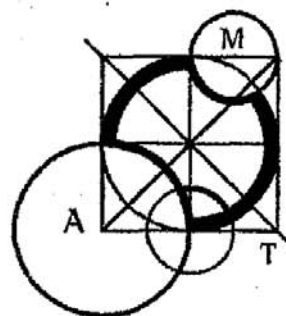**Australia's First Bank**

AUSTRALIAN MATHEMATICS COMPETITION FOR THE WESTPAC AWARDS

AN ACTIVITY OF THE AUSTRALIAN MATHEMATICS TRUST

TUESDAY 31 JULY 2001

JUNIOR DIVISION COMPETITION PAPER

SCHOOL YEARS 7 AND 8

J1

Questions 1 - 10, 3 marks each

1. $37 + 41$ equals
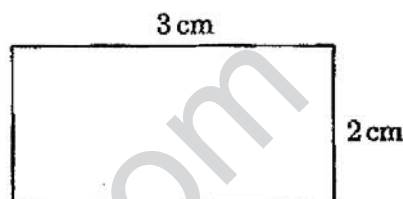
   (A) 78   (B) 88   (C) 4   (D) 50   (E) 101

2. The value of $50 - (30 \div 5)$ is

   (A) 44   (B) 52   (C) 4   (D) -4 (E) 8

3. The area, in square centimetres, of the rectangle shown in the diagram is

   (A) 5   (B) 6   (C) 7

   (D) 8   (E) 10

4. In my bank account I have $55. If I withdraw $20 the balance remaining is

   (A) $30   (B) $35   (C) $40   (D) $45   (E) $75

5. $\frac{3}{8}$ of a number is 24. The number is

   (A) 8   (B) 9   (C) 12   (D) 36   (E) 64

6. The train trip from Windsor to Homebush takes 47 minutes. If Mick leaves Windsor at 7:27 am he should arrive at Homebush at

   (A) 8:24 am   (B) 8:14 am   (C) 8:04 am   (D) 7:54 am   (E) 7:47 am

7. In the diagram, x equals

   (A) 100   (B) 110   (C) 120

   (D) 130   (E) 160
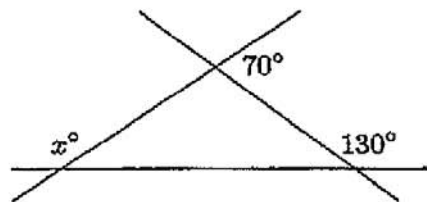
8. If I have 2 shirts and 3 ties, all of different colours, how many different colour patterns can I create by wearing one of each?

   (A) 5   (B) 6   (C) 7   (D) 8   (E) 9

9. Two points on a number line are at 2 and at 20. Five more points are inserted between these points so that all seven points are equally spaced. The fifth of these seven points from the left is at

(A) 14   (B) 17   (C) 11   (D) 16   (E) 15

10. How many counting numbers between 2 and 2002 are divisible by 3?

(A) 665   (B) 666   (C) 667   (D) 668   (E) 669
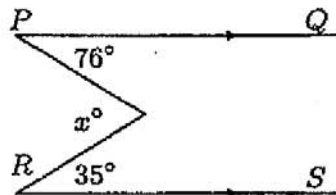
Questions 11 - 20, 4 marks each

11. Which of the following is nearest in value to

$$\frac{53.1 \times 0.046}{0.0021} ?$$
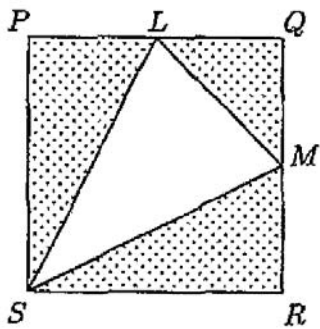
(A) 1   (B) 100   (C) 1000   (D) 10 000   (E) 100 000

12. 5 consecutive odd numbers add to 105. The largest of these numbers is

(A) 21   (B) 22   (C) 23   (D) 24   (E) 25

13. In the diagram, PQ is parallel to RS. x equals

(A) 111   (B) 41   (C) 91

(D) 121   (E) 131

14. Bill scored 12 goals from 30 shots in the first netball game this year. His shooting average was then 40%. Next game he had 10 shots and raised his average over both games to 50%. How many of these 10 shots in the second game were goals?

(A) 3   (B) 4   (C) 6   (D) 8   (E) 10

15. The length of a '50 metre' swimming pool must be accurate to within 3 cm. For a 1500 m race, what is the difference in metres between the distance swum in the longest possible pool and that in the shortest possible pool?

(A) 0.45   (B) 0.9   (C) 1.8   (D) 45   (E) 90

16. In the Cornish language, counting up to 200 is done in multiples of twenty. If 147 is 'seyth ha seyth ugens' and 49 is 'naw ha dew ugens', what is the value of 'dew ha naw ugens'?

(A) 490   (B) 92   (C) 182   (D) 184   (E) 94

17. If Jane runs at 10 km/h she completes a certain distance in 6 minutes. At what average speed, in kilometres per hour, would Jane need to cover the same distance in 8 minutes?

(A) 7.5   (B) 7.75   (C) 8   (D) 8.25   (E) 8.5

18. $PQRS$ is a square. L and M are the mid-points of PQ and QR respectively. What fraction of the square is shaded?

(A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{3}{4}$

(D) $\frac{5}{8}$ (E) $\frac{1}{4}$

19. The largest two-digit number that is the sum of two different perfect squares is

(A) 95   (B) 96   (C) 97   (D) 98   (E) 99

20. In how many ways can 12 red jellybeans be divided among the children John, Peter and Sophie, if each of them gets at least 3 jellybeans?

(A) 9   (B) 7   (C) 8   (D) 10   (E) 12

Questions 21 - 30, 5 marks each

21. In the diagram $PS = PQ$ and $QS = QR$. If $\angle SPQ = 80°$ then $\angle QRS$ equals

(A) $10°$ (B) $15°$ (C) $20°$

(D) $25°$ (E) $30°$
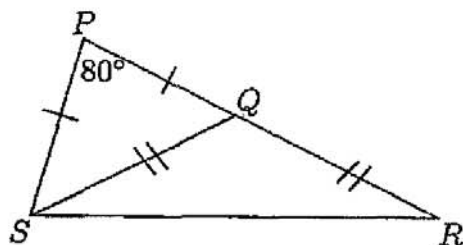
22. Let $\dfrac{s}{t}$ be a proper fraction, that is $s < t$, in lowest terms. If t has values from 2 to 9 and s is positive, how many such fractions are there?

(A) 26   (B) 27   (C) 28   (D) 30   (E) 36

23. The front chainwheel of a bike has 52 teeth and the rear sprocket has 18 teeth. When I start pedalling the bike, how many times will the front chainwheel have turned when it and the rear sprocket are next both in their starting positions?

(A) 9   (B) 52   (C) 234   (D) 468   (E) 936

24. Consider the following statement:

Let m be a positive integer. If m is not a prime, then $(m-2)$ is not a prime.

The statement can be demonstrated to be false by giving m the value

(A) 9   (B) 12   (C) 13   (D) 16   (E) 23

25. When Mr Reader packed his books into bundles of 12 books there were 2 books left unpacked. When he repacked his books into bundles of 9, there were again 2 left. Finally, when Mr Reader packed his books into bundles of 7, there were no books left unpacked. The smallest possible number of books that Mr Reader could have is

(A) less than 50   (B) between 50 and 100
(C) between 100 and 150   (D) between 150 and 200
                    (E) greater than 200

26. If x and y are non-negative integers and $3x + 4y = 96$, how many pairs (x, y) are there?

(A) 6   (B) 8   (C) 9   (D) 10   (E) 11

27. A remote control panel for a toy car has only one button. If this button is pressed, the car stops, turns 23° clockwise and continues moving at the same speed again. After the car is started, what is the smallest number of times that is needed to press the button on the control panel to bring the car to the point where it first started?

(A) 7   (B) 8   (C) 10   (D) 11   (E) 12

28. The digits 1, 2, 3 and 4 are used to generate 256 different four-digit numbers. Digits can be repeated, so 1111 and 1113 are two of the numbers. The sum of the 256 numbers is

(A) 71 440   (B) 711 040   (C) 704 110   (D) 700 410   (E) 741 040

29. Here is an example of a 14-gon (a polygon with 14 sides) which has 5 acute angles. What is the largest possible number of acute angles a 2001-gon can have if no two sides cross each other?

(A) 1001   (B) 667   (C) 1334

(D) 1335   (E) 2001
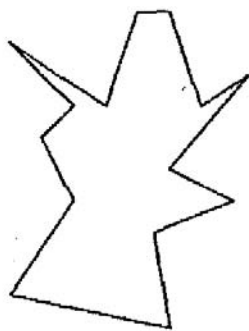
30. The number $2000 = 2^4 \times 5^3$ is the product of seven prime factors. Let x be the smallest integer greater than 2000 with this property and y be the largest integer smaller than 2000 with this property. What is the value of $x - y$?

(A) 100   (B) 64   (C) 280   (D) 203   (E) 96