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Please note:
(i) The AMC Committee regrets that orders cannot be accepted without attached payment.
(ii) The above prices are current to 31 December 1989.

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P.O. Box 1,
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Australian Mathematics Competition

for the Westpac Awards

1989 JUNIOR DIVISION COMPETITION PAPER (School Years 7 and 8)

WEDNESDAY, 2 AUGUST 1989

INSTRUCTIONS AND INFORMATION

1. Do not open this booklet until told to do so by your teacher.
2. Calculators are not permitted. Scribbling paper, graph paper, ruler and compasses are permitted.
3. All answers should be recorded on your separate answer sheet. Read carefully the instructions on this answer sheet.
4. Avoid random guessing as one quarter of the marks assigned for that question will be deducted for an incorrect response.
5. When your teacher gives the signal begin working on the problems. You have 1¼ hours working time.
6. Diagrams are NOT drawn to scale. They are intended as aids only.
7. Only use a lead pencil. Biro or ink are read as blank.
8. To ensure the integrity of the Competition and to identify outstanding students for Westpac medals, the AMC Committee reserves the right to re-examine students before deciding whether to grant official status to their score.

Questions 1-10, 3 marks each

1. $3.1 + 4.1$ equals

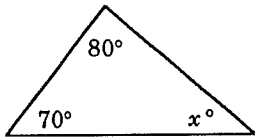
(A) 7.11 (B) 7.02 (C) 8.2 (D) 7.1 (E) 7.2

2. $\frac{3}{7} \times \frac{14}{15}$ equals

(A) $\frac{1}{5}$ (B) $\frac{2}{3}$ (C) $\frac{7}{5}$ (D) $\frac{3}{7}$ (E) $\frac{2}{5}$

3. In the diagram the value of x is

(A) 50 (B) 40 (C) 30 (D) 20 (E) 10



4. $\frac{1}{2} + \frac{1}{3}$ equals

(A) $\frac{2}{5}$ (B) $\frac{5}{6}$ (C) $\frac{3}{4}$ (D) $\frac{2}{3}$ (E) 1

5. $0.9 \div \frac{1}{2}$ equals

(A) 1.8 (B) 0.45 (C) 0.3 (D) 0.18 (E) 4.5

6. 3% of \$105 equals

(A) \$315 (B) \$305 (C) \$3.50 (D) \$3.15 (E) \$3.05

7. If the greatest and least of the numbers 0.31, 0.303, 0.5, 0.675 and 0.68 are added, the sum is

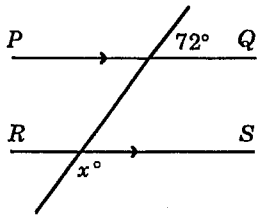
(A) 0.99 (B) 0.985 (C) 0.983 (D) 0.978 (E) 1.175

8. Mary wanted to divide a certain number by 4 to get an answer. However she used the calculator incorrectly and multiplied by 4 instead and got 60. The correct answer would be

(A) 3.75 (B) 15 (C) 4 (D) 12 (E) 240

9. In the diagram PQ is parallel to RS. The value of x is

(A) 144 (B) 128 (C) 72 (D) 118 (E) 108



10. At our school the first class starts each morning at 9.00 am and the last class finishes at 3.00 pm. We have a morning break of 20 minutes and a lunch break of 1 hour. The total time remaining for classes each day is

(A) 4 hours 40 mins (B) 5 hours 20 mins (C) 4 hours 30 mins (D) 4 hours 20 mins (E) 4 hours 50 mins

Questions 11-20, 4 marks each

11. $2 - ((2 \times 3) - 8)$ equals

(A) 0 (B) -4 (C) -8 (D) 4 (E) -2

12. It is estimated that about one million people gathered around Sydney Harbour on 26 January 1988 for the Australian Bicentennial celebrations. If there were 16 million people in Australia, then the percentage of them present that day was closest to

(A) 1 (B) 4 (C) 6 (D) 8 (E) 16

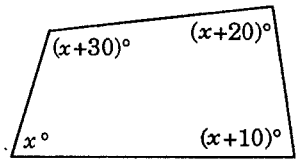
13. The manufacturers of a certain pen claim that it can draw a line 1 km long before it runs dry. If the line it draws is 0.4 mm wide, then the area, in square metres, that the pen is expected to cover is

(A) 4000 (B) 400 (C) 40 (D) 4 (E) 0.4

14. Find the sum of all the two-digit numbers greater than 10 such that the tens digit is one less than the units digit.

(A) 476 (B) 414 (C) 486 (D) 404 (E) 495

15. The sizes of the angles of a quadrilateral are x, $x+10$, $x+20$, and $x+30$ degrees. The largest angle, in degrees, is

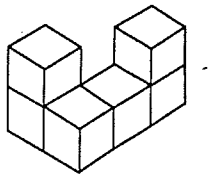


(A) 75 (B) 85 (C) 95 (D) 105 (E) 115

16. An athlete runs 70 metres in 8.4 seconds. If she were to maintain the same average speed for 100 metres her time for 100 metres, in seconds, would be

(A) 14.28 (B) 12.0 (C) 11.8 (D) 11.4 (E) 13.2

17. The object shown in the diagram is made by glueing together the adjacent faces of six wooden cubes, each having edges of length 1 cm. The total surface area of the object, in square centimetres, is



(A) 32 (B) 26 (C) 31 (D) 36 (E) 18

18. In 1987 the toll for a motor cycle on the Sydney Harbour Bridge rose from 5 cents to \$1. The percentage by which this toll increased was

(A) 95 (B) 20 (C) 100 (D) 1900 (E) 2000

19. A supermarket displays a certain soap by stacking the boxes in a ten-layered pyramid, each layer having a rectangular shape with one less box both in length and in width than the layer below. If the top layer consists of one row of six boxes, how many boxes are there in the total stack?

(A) 466 (B) 420 (C) 480 (D) 660 (E) 720

20. A mathematics test consists of ten questions. Ten points are given for each correct answer and three points are deducted for each incorrect answer. If Wolfgang did all questions and scored 61 his number of correct answers was

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

Questions 21-30, 5 marks each

21. S is the set of numbers from 1 to 100 whose smallest prime factor is 7. How many numbers are in S?

(A) 14 (B) 7 (C) 4 (D) 3 (E) 5

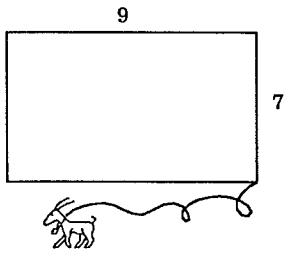
22. Students in a group dancing class are spaced evenly around a circle and are then counted off consecutively from number 1. Student 20 is directly opposite student 53. How many students are there in the group?

(A) 60 (B) 62 (C) 64 (D) 66 (E) 68

23. Every day, Stan either walks to work and rides his bicycle home or rides his bicycle to work and walks home. Either way, the round trip takes $1\frac{1}{2}$ hours. If he were to ride both ways, it would take 30 minutes. How many hours would a round trip take if Stan walked both ways?

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

24. Amos the goat is tied by a rope to a corner of a rectangular shed as shown. The shed is 9 metres long and 7 metres wide and the rope is 10 metres long. The shed is surrounded by grass. The area, in square metres, that the goat can graze upon is



(A) $\frac{155\pi}{2}$ (B) $\frac{229\pi}{4}$ (C) 75π (D) $160+\frac{5\pi}{2}$ (E) $\frac{309\pi}{4}$

25. What would be the third number from the left of the 89th row of the accompanying triangular number pattern?

1
2 3 4
5 6 7 8 9
10 11 12 13 14 15 16
⋮

(A) 8103 (B) 6982 (C) 10681 (D) 7747 (E) 7924

26. What is the first time after 4 o'clock that the hands of the clock make an angle of 65°?

(A) 4.06 (B) 4.07 (C) 4.08 (D) 4.09 (E) 4.10

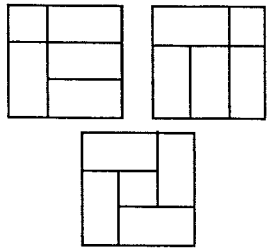
27. In a certain country they have an unusual currency. The basic unit is the dollar, for which there is a one dollar note. For smaller transactions they have half-dollar, third-dollar, quarter-dollar and fifth-dollar coins. What is the largest amount of the money, in dollars, of this country one could carry in coins without having exact change of a dollar?

(A) $2\frac{43}{60}$ (B) $\frac{11}{12}$ (C) $1\frac{5}{12}$ (D) $2\frac{13}{60}$ (E) $2\frac{7}{15}$

28. There are 300 girls who represent a certain school in both summer and winter sports. In summer 60% of these girls play cricket and the other 40% play squash. In winter the girls play hockey or netball but not both. 56% of the hockey players take cricket in summer and 30% of the cricket players take netball in winter. The number of girls who play netball and squash is

(A) 54 (B) 30 (C) 120 (D) 99 (E) 21

29. How many ways are there of dividing a 3×3 square into one 1×1 square and four 2×1 rectangles? (Three ways are shown.)



(A) 6 (B) 12 (C) 16 (D) 17 (E) 18

30. The number of cats in Balmain
is six digits long, I maintain.
It's a cube. It's a square.
If six cats went elsewhere,
a prime number of them would remain.

The number of cats in Balmain is

(A) 279 643 (B) 117 649 (C) 262 147 (D) 531 469 (E) 999 997