QUEEN'S COLLEGE
Half-yearly Examination, 2009-2010

MATHEMATICS PAPER II

Secondary 1

Date: 8/1/2010
Time: 10:30am - 11:30am

1. Write down the information required in the spaces provided in the Answer Sheet.

2. When told to open this question paper, check that all the questions are there. Look for the words ‘END OF PAPER’ after the last question.

3. ANSWER ALL QUESTIONS. All the answers should be marked on the Answer Sheet.

4. Note that you may mark only ONE answer to each question. Two or more answers will score NO MARKS.

5. All questions carry equal marks. No marks will be deducted for wrong answers.

6. This paper consists of 5 pages printed on 3 pieces of paper.

7. Calculator is not allowed in this paper.
There are 40 questions in this paper. The diagrams in this paper are not necessarily drawn to scale.

1. ‘Divide 6 by the difference between 30 and 18’ is denoted as
   A. $6 \div 30 - 18.$
   B. $6 \div (30 - 18).$
   C. $30 - 18 \div 6.$
   D. $(30 - 18) \div 6.$

2. $720 =$
   A. $2^3 \times 3^2 \times 5$
   B. $2^3 \times 3^4 \times 5$
   C. $2^4 \times 3 \times 5^2$
   D. $2^4 \times 3 \times 5^2$

3. If $x = -3,$ what is the value of $-5x^2?$
   A. $-225$
   B. $45$
   C. $45$
   D. $225$

4. If $2t - \frac{2}{9} = -\frac{1}{6},$ then $t$ is
   A. $\frac{1}{36}$
   B. $-\frac{1}{36}$
   C. $\frac{1}{9}$
   D. $\frac{1}{9}$

5. The numbers $-1, \frac{-4}{3}, \frac{4}{9}, \frac{-2}{8}, \frac{-3}{9}$ when arranged in descending order of magnitude take the form
   A. $\frac{-4}{3}, -1, \frac{4}{9}, \frac{3}{8}, \frac{-2}{9}$
   B. $-1, \frac{-4}{3}, \frac{4}{9}, \frac{-2}{8}, \frac{-3}{9}$
   C. $\frac{-2}{9}, \frac{3}{8}, \frac{-3}{9}, -1, \frac{-4}{3}$
   D. $\frac{4}{9}, -\frac{2}{9}, \frac{3}{8}, \frac{-4}{3}, -1$

6. On a vertical number line, which of the following is false?
   A. Any positive number is on the top of any negative number.
   B. $-3.6$ is below $-3.5.$
   C. $0.1$ is on the top of $-0.3.$
   D. Numbers get smaller from bottom to top.

7. Given the formula $d = \frac{\sqrt{v^2 - u^2}}{2a}.$ Find the value of $d$ if $v = 12, u = 10$ and $a = 10.$
   A. $0.2$
   B. $2.2$
   C. $4.4$
   D. $6.7$

8. The base of a triangle is $2m$ and the height is four times its base, find the area of the triangle.
   A. $2m^2$
   B. $4m^2$
   C. $8m^2$
   D. $8m$

9. Which of the following is not true?
   A. $0$ is neither positive nor negative.
   B. $-\frac{1}{10} > -\frac{1}{8}.$
   C. The sum of three negative numbers is negative.
   D. The product of three negative numbers is positive.

10. In the formula $S = \frac{n(n+1)}{2},$ what is the value of $S$ when $n = 100?$
    A. 10100
    B. 1010
    C. 50500
    D. 5050
11. The figure shows two circles with centres P and Q, and whose diameters are both 3 cm. Find the length of the line segment AB if A, P, Q and B lie on a straight line.

A. 6 cm  
B. 5.5 cm  
C. 5 cm  
D. 4.5 cm

12. \(-2(-4v)^2 = \)

A. \(-32v^2\).  
B. \(32v^2\).  
C. \(-64v^2\).  
D. \(64v^2\).

13. What is the sum of three consecutive even numbers of which \(x\) is the biggest?

A. \(3x - 3\)  
B. \(3(x - 1)\)  
C. \(3x - 4\)  
D. \(3x - 6\)

14. If the number pattern of a sequence is \((n^2 - 1)(n - 1)\), find the third term of the sequence.

A. \(3(n^2 - 1)(n - 1)\)  
B. 16  
C. 27  
D. 64

15. The number pattern of a square sequence is

A. \(\frac{n^2 + n}{2}\).  
B. \(2n\).  
C. \(n^2\).  
D. \((n-1)(n+1)\).

16. The L.C.M. of 10, 24, 36 is

A. 2.  
B. 240.  
C. 360.  
D. 864.

17. \((3n)^3 ÷ (3n^3) = \)

A. 1.  
B. 9.  
C. 9n.  
D. \(27n^2\).

18. Find the product of the first 4 triangular numbers.

A. 18  
B. 20  
C. 180  
D. 360

19. \((-1)^{2009}\) is equal to

A. 1.  
B. -1.  
C. 2009.  

20. The following figures are formed by matches of equal length.

What sequence is formed by the numbers of matches in the figures?

A. Arithmetic sequence  
B. Geometric sequence  
C. Square sequence  
D. Triangular sequence

21. Leon has \(x\) and Jacky has twice as much money as Leon. If Jacky spends \$15 and gives half of the remainder to his brother, how much does Jacky still have?

A. \(\frac{x}{15}\)  
B. \(\frac{2x + 15}{2}\)  
C. \(\frac{2x - 15}{2}\)  
D. \(4x - 60\)
22. How many right angles does 292.5° equal?
   A. 3 right angles
   B. $\frac{3}{4}$ right angles
   C. $\frac{3}{2}$ right angles
   D. $\frac{3}{4}$ right angles

23. Which of the following is/are the number pattern of the sequence 3, 12, 27, 48, 75, ...?
   I. $3(n + 3)$  
   II. $3n^2$  
   III. $(n + 2)^2$  
   A. I only  
   B. II only  
   C. III only  
   D. I and II

24. A book marked at $M$ was sold at a discount of 20%. If the selling price of the book is $120, then $M =$
   A. 24  
   B. 96  
   C. 100  
   D. 150

25. The management fee of a flat is $1200 in 2007 and it will be increased by $x\%$ in 2008. If the management fee will be $1464 in 2008, find $x$.
   A. 12  
   B. 15  
   C. 20  
   D. 22

26. Solve the equation $-4 = \frac{3x}{4} + 2$.
   A. $-8$  
   B. $-7$  
   C. $-\frac{16}{3}$  
   D. $-\frac{19}{3}$

27. Square kilometre (km²) is an appropriate unit of measurement for measuring
   A. the area of a piece of newspaper.  
   B. the length of the Great Wall.  
   C. the area of Q.C. School Hall.  
   D. the area of Hong Kong Island.

28. The perimeter of the square is 48 cm, find the value of $3a$.

29. Which one of the following is correct:
   A. We can draw a straight line passing through any two different points.  
   B. The surface of a ball is a plane.  
   C. Two straight lines in a plane can always cut at a point.  
   D. We use a protractor to measure the length of a line segment.

30. In the figure, what percentage of the shaded part is the unshaded part?
   A. $108\frac{3}{4}\%$  
   B. $92\frac{4}{13}\%$  
   C. 52%  
   D. 48%

31. Round 49,235 to the nearest thousand
   A. 49,000  
   B. 49,200  
   C. 50,000  
   D. 50,235

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32. Find the area of the rectangle of dimensions 262 cm \times 468 cm.

A. $1.22616 \text{ m}^2$
B. $12.2616 \text{ m}^2$
C. $1226.16 \text{ m}^2$
D. $122.616 \text{ km}^2$

33. $80\% \times (1 + 20\%) \div 60\% =$

A. $\frac{8}{5}$
B. $\frac{5}{3}$
C. $\frac{5}{8}$
D. $\frac{3}{5}$

34. An amount is decreased by 15% and the result is then increased by 15%. Finally the amount

A. has no change.
B. is increased by 2.25%.
C. is decreased by 2.25%.
D. is decreased by 22.5%.

35. Using compatible numbers, estimate:
\[41.495 \div 6.887 \times 30.123\]

A. 160
B. 170
C. 180
D. 190

36. What percentage is 6 minutes in an hour?

A. 6%
B. 10%
C. 25%
D. 60%

37. Which of the following is true?

A. $(abcd)(abcd) = 2abc$
B. $(a^2)(b^2) = (ab)^4$
C. $(-4xy)(-3xy) = 12xy^2$
D. $(4u)(-3u)^2 = 36u^3$

38. What is the simple interest on $2400 at 4\% \text{ p.a. for 2 years}?

A. $96$
B. $192$
C. $480$
D. $2592$

39. Peter bought a DVD player in a sale at a discount of 15\% of the marked price. If he paid $1275, the amount of the discount was

A. $150$
B. $191.25$
C. $225$
D. $1500$

40. Which of the following expressions must be correct?

A. obtuse angle \(-\) right angle
   = acute angle
B. acute angle \(+\) obtuse angle
   = obtuse angle
C. acute angle \(+\) obtuse angle
   = reflex angle
D. reflex angle \(-\) straight angle
   = obtuse angle

END OF PAPER
### S.1 MATHEMATICS PAPER II

**Suggested Solution**

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