

# UPCAT

FREE *Reviewer*

**MATHEMATICS**  
upcatreview.com



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# Read This First Before You Proceed!

The Compiled UPCAT Questions is a collection of UPCAT review questions put together by former UP Proctors and Examiners throughout the years.

It is by no means a leakage... it's just a compilation based on the feedbacks of students about the test. There is no guarantee that the same questions will appear in the next UPCAT. However, studying these questions will give you an idea of what the UPCAT contains and how to go about it.

## So why are we giving this for free?

I'll cut the chase and get straight to the point. By giving you the Compiled UPCAT Questions for free, you will know that we are providing you quality materials that you can use right away.

**We want you to trust us.**

We want to build a relationship with you. And through our materials and [review program](#), we want you to pass UPCAT and other college entrance tests.

That's why we want you to enroll in the Review Masters [UPCAT Review Program](#).

We believe that through the complete UPCAT review program, you can be more prepared to take the UPCAT and other entrance exams.

In addition to this, we want you to have an idea of what questions and topics to expect when you take the UPCAT. It's better to be prepared than to be caught off-guard.

Thousands of students have already passed UP by using the Review Masters website (<https://www.upcatreview.com>) and materials (we have about 3000 passers for the past 7 years). **Now your time has come to be one of them.**

# How to use this material

Here's what we suggest:

- Print this compiled UPCAT Questions reviewer.
- Give yourself about **125 minutes** for the test. Answer it as if you are taking the actual exam.

After answering, check your work using the provided answer key. You may visit our [Facebook page](#) or the [Ka-TOURs group](#) if ever you have questions on some of the items in the compilation.

You may also go to the Online Review Portal to take an automated version of the test.

## But the most important thing that you really need...

Reviewing for the test is just one of the factors so you can pass the UPCAT. But I believe that the most essential factor that you need in order to pass UP is your strong DaD - **DESIRE and DETERMINATION**. No amount of review can help you if you do not want to pass and you are not determined to do everything to succeed.

So, do everything to prepare yourself for UPCAT. [Enroll in our review program](#). We at Review Masters are here to help you Pass UPCAT - the Sure Way!

All for the best!

- The Review Masters Team -

# MATHEMATICS (125 mins)

Choose the letter of the best answer.

1.  $15\frac{1}{3} - 5\frac{1}{2} =$

- A.  $8\frac{2}{3}$
- B.  $9\frac{1}{3}$
- C.  $9\frac{5}{6}$
- D.  $10\frac{1}{3}$

2.  $\frac{16}{5} =$

- A. 3.2%
- B. 3.25%
- C. 32.5%
- D. 320%

3.  $5.75 =$  \_\_\_\_\_

- A.  $11/2$
- B.  $17/3$
- C.  $23/4$
- D.  $29/5$

4. Divide 42 by  $3\frac{1}{3}$

- A.  $12\frac{3}{5}$
- B.  $14\frac{2}{3}$
- C. 15
- D.  $16\frac{1}{5}$

5.  $||2 - 7| - |8 - 14|| =$

- A. -11
- B. -1
- C. 1
- D. 11

6. What is the product of -1.54 and -1.64?

- A. 252.56
- B. 25.256
- C. 2.5256
- D. -2.5256

7.  $-4[8 - (5 - 2)] - 3 =$

- A. 15
- B. 17
- C. -17
- D. -23

8.  $(x^3y^2)^4 =$

- A.  $x^7y^6$
- B.  $x^{12}y^8$
- C.  $x^8y^6$
- D.  $x^3y^8$

9. Which of the following has the lowest value?

- A.  $\frac{3}{8}$
- B.  $0.2^2$
- C.  $\frac{2}{25}$
- D. 10%

10. Which of the following has the largest value?

- A. 0.7
- B. 0.77
- C. 0.777
- D. 0.077

11.  $(4^2)(5^2)$

- A.  $9^2$
- B.  $9^4$
- C. 200
- D. 400

12. Which of the following has the greatest value?

- A.  $\frac{2}{3}$
- B.  $\frac{5}{8}$
- C.  $\frac{3}{4}$
- D. 0.675

13. Which of the following fractions has the smallest value?

- A.  $\frac{7}{4}$
- B.  $\frac{8}{5}$
- C.  $\frac{27}{20}$
- D.  $\frac{67}{60}$

14.  $\frac{3}{5} \times \frac{5}{7} \times \frac{7}{9} \times \frac{9}{11} =$

- A.  $\frac{3}{11}$
- B.  $\frac{15}{99}$
- C.  $\frac{63}{35}$
- D.  $\frac{105}{385}$

15.  $\frac{?}{32} = 0.875$

- A. 16
- B. 18
- C. 24
- D. 28

16.  $\frac{4}{5} + \frac{1}{2} + \frac{3}{x} = \frac{41}{20}, x = ?$

- A. 4
- B. 5
- C. 6
- D. 7

17. If  $\frac{m}{24} = 0.625$ , what is the numerical value of m?

- A. 12
- B. 13
- C. 14
- D. 15

18. What part of  $y$  is  $x$ ?

- A.  $xy$
- B.  $\frac{x}{y}$
- C.  $\frac{y}{x}$
- D.  $\frac{1}{xy}$

19. Which of the following groups of numbers are multiples of 6 between 81 and 100?

- A. 84, 90
- B. 86, 92
- C. 84, 90, 96
- D. 86, 92, 98

20. What is the value of  $\frac{m-n}{m+n}$  when  $m$  equals  $\frac{1}{3}$  and  $n$  equals  $\frac{3}{4}$ ?

- A.  $-\frac{2}{7}$
- B.  $-\frac{5}{13}$
- C.  $-3\frac{1}{2}$
- D.  $-2\frac{3}{5}$

21. 20 is 125% of what number?

- A. 7
- B. 9
- C. 10
- D. 16

22.  $4^2 + 4^0 + 4^{-4} =$

- A.  $16\frac{1}{4}$
- B.  $17\frac{1}{4}$
- C. 12
- D. 13

23.  $0.489 \times 0.592 \times 0.798 \times 0.875 \times 0.23$  is approximately equal to

- A.  $\frac{2}{25}$
- B.  $\frac{7}{125}$
- C.  $\frac{1}{5}$
- D.  $\frac{27}{625}$

24. What is 75% of  $\frac{2}{3}$ ?

- A.  $\frac{2}{3}$
- B.  $\frac{3}{4}$
- C.  $\frac{1}{2}$
- D.  $\frac{1}{3}$

25. The product of -3 and -6 is how much larger than the sum of -2 and -7?

- A. 9
- B. 12
- C. 15
- D. 27

26. Which expression has the largest value?

- A.  $|7|$
- B.  $|7 - 2|$
- C.  $2 - |7|$
- D.  $|-7| + 2$

27. What is the weight, in kilograms of 26 sacks of sugar if 156 sacks weigh 12 kg?

- A. 2
- B. 3
- C. 4
- D. 5

28.  $\sqrt{64x^7} =$

- A.  $8x^3$
- B.  $4x^3$
- C.  $8x^2\sqrt{x}$
- D.  $8x^3\sqrt{x}$

29. If  $m - 4 = 9$ , then  $3m - 5 =$

- A. 10
- B. 17
- C. 20
- D. 34

30. The point with coordinates  $(-5, 3)$  is in quadrant

- A. I
- B. II
- C. III
- D. IV

31. If  $a$  and  $b$  are both odd numbers, then which of the following must be an odd number?

- A.  $a + b$
- B.  $ab + 1$
- C.  $2a + 4b$
- D.  $a + b + 3$

32. Last week, Vince read from page 139 to page 225 inclusive in his History book. How many pages did he read?

- A. 86
- B. 87
- C. 88
- D. 89

33. Anne will be  $P$  years old in  $Q$  years. Her age  $R$  years ago was

- A.  $P + Q - R$
- B.  $P - Q + R$
- C.  $P + Q + R$
- D.  $P - Q - R$

34. If a jeepney ride costs P8.50 for the first four kilometers and P1.50 for each additional kilometer or fraction thereof, then how much would a passenger pay for a 12 km ride?

- A. P10.00
- B. P18.00
- C. P18.50
- D. P20.50



35.  $(5x^2 - 4x + 3) - (3x^2 + 4x - 3) =$

- A.  $2x^2$
- B.  $-2x^2$
- C.  $2x^2 - 8x$
- D.  $2x^2 - 8x + 6$

36. If  $6x - 15 < 4 + 5$ , then

- A.  $x > 6$
- B.  $x < 6$
- C.  $x < 4$
- D.  $x < -4$

37. How far can Jaiah go on her scooter from 3:35 p.m. to 4:15 p.m. at 30 km per hour?

- A. 20 km
- B. 18 km
- C.  $17\frac{1}{2}$  km
- D. 16 km

38.  $\frac{a}{b} - \frac{a}{c} =$

- A.  $\frac{1}{bc}$
- B.  $\frac{a}{b-c}$
- C.  $\frac{ab-ac}{bc}$
- D.  $\frac{ac-ab}{bc}$

39. 1, 8, 27, 64, 125, ?

- A. 175
- B. 201
- C. 216
- D. 225

40. Which equation is not satisfied by  $x = -3$ ?

- A.  $x^2 - x - 6 = 0$
- B.  $x^2 + x - 6 = 0$
- C.  $x^2 - 9 = 0$
- D.  $x^2 + 6x + 9 = 0$

41. What percent profit was made on a pair of pants that was bought for P250 and sold for P350?

- A. 10%
- B. 20%
- C. 30%
- D. 40%

42. If  $y < -2$ , which of the following must have the greatest value?

- A.  $\frac{2}{y}$
- B.  $\frac{y}{2}$
- C.  $\frac{2}{y+1}$
- D.  $\frac{2}{y-1}$

43.  $(3x + 2)(4x - 5) =$

- A.  $12x^2 - 10x$
- B.  $12x^2 + 10x - 0$
- C.  $12x^2 - 7x - 10$
- D.  $12x^2 - 23x - 10$

44. If  $0.002x = 2$ , then  $2.2x =$

- A. 2002
- B. 2020
- C. 2200
- D. 2202

45. Find the value of  $\frac{m-n}{m} + \frac{n-m}{n}$  if  $m$  is 20 and  $n$  is 10.

- A.  $-\frac{1}{2}$
- B. 0
- C.  $\frac{1}{2}$
- D. 1

46.  $\frac{y-1}{y^2-1}$

- A.  $\frac{1}{y}$
- B.  $\frac{1}{y+1}$
- C.  $\frac{1}{y-1}$
- D.  $\frac{1}{y^2}$

47. What is the average of all even integers from 2 to 40?

- A. 20
- B. 21
- C. 22
- D. 23

48. Review Masters increases its enrollees by 25% yearly. What is the ratio of the enrollees in one year to the enrollees in the previous year?

- A. 1:4
- B. 4:1
- C. 5:4
- D. 4:5

49. Mark Caguioa scored an average of 29 for his first three games and an average of 32 for his next four games; then his average so far is about

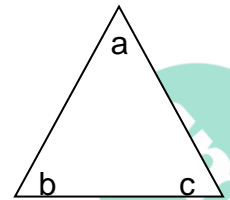
- A. 28
- B. 29
- C. 30
- D. 31

50. Ning is 8 years younger than her brother Michael. Twenty-eight years ago, she was half as old as Michael. How old is Michael now?

- A. 44
- B. 42
- C. 40
- D. 36

51. If the triangle below is an isosceles with  $a$  as the vertex angle, which set of numbers could be values of  $a$ ,  $b$ , and  $c$  respectively?

- A. (50, 65, 65)
- B. (50, 50, 80)
- C. (50, 60, 70)
- D. (70, 60, 60)



52. What is the area of a square inscribed in a circle having a diameter of 4 cm?

- A.  $4 \text{ cm}^2$
- B.  $8 \text{ cm}^2$
- C.  $4\pi \text{ cm}^2$
- D.  $8\pi \text{ cm}^2$

53. A triangle has the following points as vertices:  $(0, 0)$ ,  $(3, 4)$ , and  $(6, 0)$ . This triangle is

- A. a scalene triangle
- B. an isosceles triangle
- C. a right triangle
- D. an equilateral triangle

54. The diameter of a wheel is 6 cm. How many complete revolutions will the wheel make if it rolls a distance of  $108\pi$  cm?

- A. 6
- B. 12
- C. 18
- D. 24

55. The length, width, and height of a large box are thrice those of a smaller box. The volume of the large box is

- A. thrice that of the smaller box
- B. 6 times that of the smaller box
- C. 9 times that of the smaller box
- D. 27 times that of the smaller box

56. On a number line, if one endpoint of a line segment is at  $-12$ , and its midpoint is at  $-4$ , then the other endpoint is at

- A. 0
- B. 12
- C. 8
- D. 4

57. A telephone pole is 9 meters tall. What is the length of a piece of wire which extends from the top of the pole to a point that is 12 meters from the base of the pole?

- A. 21
- B. 18
- C. 15
- D. 12

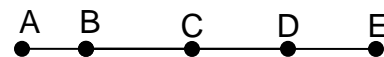
58. If the measures of the angles of a triangle are in the ratio  $2:3:4$ , what is the degree measure of the smallest angle?

- A. 20
- B. 30
- C. 40
- D. 60

59. The width of a rectangular rug is 4 feet. If the perimeter is 20 feet, what is the length of the rug?

- A. 4 feet
- B. 5 feet
- C. 6 feet
- D. 16 feet

60. If  $AC = 18$ ,  $BE = 13$ ,  $DE = 3$  and  $D$  is the midpoint of  $CE$ , what is  $AB$ ?



- A. 10
- B. 11
- C. 12
- D. 13

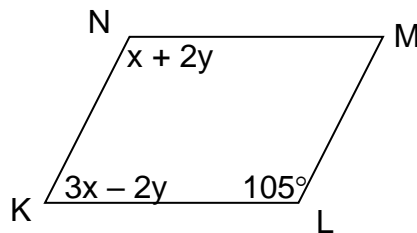
61. If four lines are drawn in a plane, what is the maximum possible number of points of intersection of the lines?

- A. 4
- B. 5
- C. 6
- D. 7

62. The perimeter of a triangle is 90 cm. The measure of the longest side is 6 less than the sum of the measures of the other two sides. Four times the measure of the shortest side equals the sum of the measures of the other two sides. What is the length in cm of the shortest side of the triangle?

- A. 30 cm
- B. 24 cm
- C. 20 cm
- D. 18 cm

63. In the figure, KLMN is a parallelogram with angle measures as marked. Find  $x + y$ .



- A. 75
- B. 105
- C. 115
- D. 120

64. What is the sum of the measures of the angles of this polygon?

- A. 720
- B. 900
- C. 1080
- D. 1260

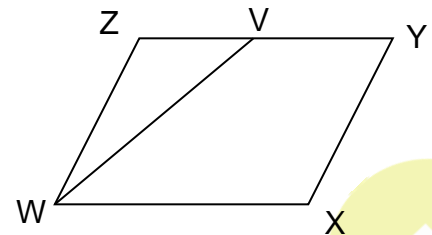


65. When the length of a rectangle is divided by 4 and the width is tripled, the area of the new rectangle is the area of the original one multiplied by \_\_\_\_.

- A. 4
- B. 3
- C. 2
- D.  $\frac{3}{4}$

66. In parallelogram WXYZ, V is the midpoint of ZY. The area of  $\triangle WZV$  is what percent of the area of WXYZ?

- A. 20%
- B. 25%
- C. 30%
- D. 33%



67. The figure has four squares placed side by side. How many rectangles are in the figure?

- A. 6
- B. 8
- C. 10
- D. 12



68. An isosceles triangle with base 10 cm has an area of  $60 \text{ cm}^2$ . Find its perimeter.

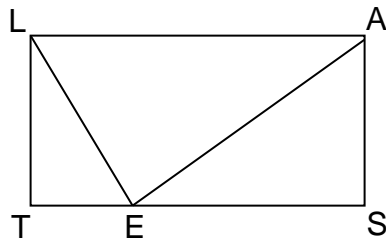
- A. 18 cm
- B. 36 cm
- C. 40 cm
- D. 48 cm

69. If the sides of a quadrilateral are 8, 14, 12, and 20 cm and the longest side of a similar quadrilateral is 30 cm, how long is the shortest side of this quadrilateral?

- A. 5 cm
- B. 12 cm
- C. 15 cm
- D. 16 cm

70. In the figure, the ratio of the area of triangle LEA to the area of rectangle LAST is

- A. 1:2
- B. 2:1
- C. 1:4
- D. 4:1



71. Point A(5,3) is the midpoint of line OAK, where O is at the origin. The coordinates of K are:

- A. (2.5, 1.5)
- B. (8, 8)
- C. (-5, -3)
- D. (10, 6)

72. The perimeter of a square is 24. What is the length of a diagonal of this square?

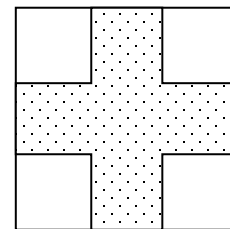
- A.  $6\sqrt{6}$
- B.  $6\sqrt{2}$
- C.  $\sqrt{2}$
- D.  $24\sqrt{2}$

73. If a triangle has sides 4, 8 and 11, which could be the sides of a similar triangle?

- A. (2, 4, 5 ½)
- B. (8, 16, 24)
- C. (7, 11, 14)
- D. (2, 6, 9)

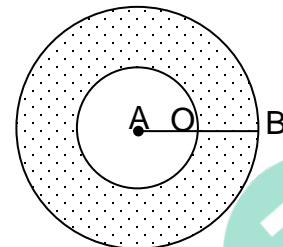
74. The area of the whole figure below is 42. If four congruent squares each with a perimeter of 8 are cut to form a cross as shown, what is the area of the cross?

- A. 20
- B. 24
- C. 26
- D. 30



75. In the figure, if  $AO = 5$  and  $OB = 3$ , what is the area of the shaded region?

- A.  $16\pi$
- B.  $25\pi$
- C.  $39\pi$
- D.  $64\pi$



76. If  $x = 1 - \frac{1}{1 - \frac{1}{2}}$  then  $x =$  \_\_\_\_\_.

- A. -2
- B. -1
- C. 0
- D. 1

77. Given:  $f(x) = 5x^4 - 3x^3 - x^2 + 2x + 5$ .  
Find  $f(-1) - f(1)$ .

- A. -1
- B. 0
- C. 1
- D. 2

78. A biker took 2 hours to ride 24 km and then returned by the same route. If he rode at an average speed of 8 km/hr on the return trip, what was his average speed in km/hr for the round trip?

- A. 8
- B. 9.6
- C. 10
- D. 10.5

79. If the sum of two positive integers is 16 and the difference of their squares is 64, what is the difference of the two integers?

- A. 32
- B. 16
- C. 8
- D. 4

80. Find the value of  $q$  so that  $\frac{q}{x} - 2x = 3$  has 4 as a root.

- A. 4
- B. 20
- C. 38
- D. 44

81. If  $2 \leq a \leq 4$  and  $3 \leq b \leq 6$ , what is the greatest value of  $a^2 - b^2$ ?

- A. -32
- B. -20
- C. 5
- D. 7

82. The expression  $\frac{x}{(x^2 + 9)(x - 5)}$  represents a real number for all real values of  $x$  EXCEPT \_\_\_\_\_.

- A. -3
- B. 3
- C. 5
- D. -5

83. If  $(6^3)(5^5) = 25(30^k)$ , then what is the value of  $k$ ?

- A. 3
- B. 4
- C. 6
- D. 8

84. Simplify:  $\sqrt[4]{27x^2} \cdot \sqrt{9x^4}$

- A.  $3x\sqrt{3x}$
- B.  $3x$
- C.  $\sqrt{3x}$
- D.  $\sqrt[4]{3x}$

85. What is the remainder when  $2x^4 - x^3 + 3x - 1$  is divided by  $x + 2$ ?

- A. 0
- B. 2
- C. -2
- D. 33

86. If  $x = y + 4$  and  $x = 20 - y$ , then what is the value of  $x^2 - y^2$ ?

- A. 24
- B. 80
- C. 16
- D. 5

87. The sum of squares of two numbers is 225 and the square of their sum is 441. What is the reciprocal of their product?

- A. 108
- B.  $\frac{1}{108}$
- C. 216
- D.  $\frac{1}{216}$

88. If  $\log_{10}x + \log_{10}8 = \log_{10}16$ , then  $x$  is equal to \_\_\_\_\_.

- A. 2
- B. 4
- C. 8
- D. 16

89. The solution set of  $3y + 2x \geq 2$  does NOT include points in quadrant \_\_\_\_\_.

- A. I
- B. II
- C. III
- D. IV

90. Find the fourth term of the arithmetic progression  $x, y, 2y - x, \dots$

- A.  $2x - y$
- B.  $3x - y$
- C.  $3y - 2x$
- D.  $2x - 3y$

91. For any real number  $x$ ,  $(x-3)^5 - (x-2)(x-3)^4 =$  \_\_\_\_\_.

- A. -1
- B.  $(x-3)^4$
- C.  $-(x-3)^4$
- D.  $-5(x-3)^4$

92. Which of the following has the same value as  $i^{62}$ ?

- A.  $i$
- B. -1
- C. 1
- D.  $-i$

93. The product of  $(-x^{m+1})$  and  $(-x^{m-1})$  is

- A.  $x^{2m}$
- B.  $-x^{2m}$
- C.  $x^{m-1}$
- D.  $-x^{m+1}$

94. If  $y$  is an integer and  $y + 3 > 0$ , what is the least possible value of  $y$ ?

- A. -3
- B. -2
- C. -1
- D. 2

95.  $2(2x^3)$  is equal to \_\_\_\_\_.

- A.  $4x^3$
- B.  $2x^3$
- C.  $2x^3 + 1$
- D.  $2x^3 + 2$

96. For what value of  $k$  does the graph of  $y = x^2 - 3x - k$  pass through the point  $(-1, 2)$ ?

- A. 6
- B. 2
- C. 0
- D. -2

97. If the ratio of  $x$  to  $y$  is 3:7, what is the ratio of  $x+y$  to  $x$ ?

- A. 3:10
- B. 7:10
- C. 10:3
- D. 10:7

98. What is the  $x$ -intercept of the line  $2x + 7y + 15 = 0$ ?

- A.  $\frac{15}{7}$
- B.  $\frac{2}{15}$
- C.  $-\frac{15}{2}$
- D. 15

99. If the reciprocal of  $x+1$  is  $x - 1$ , then what is  $x$ ?

- A.  $\pm\sqrt{2}$
- B.  $\sqrt{2}$
- C. 0
- D. 2

100. If  $xy + yz + xz = -10$  and  $xyz = 8$ ,

then  $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \underline{\hspace{2cm}}$ .

- A. -80
- B.  $-\frac{5}{4}$
- C.  $-\frac{4}{5}$
- D.  $\frac{4}{5}$



**ANSWER KEY:**

1. C	11. D	21. D	31. D	41. D	51. A	61. C	71. D	81. D	91. C
2. D	12. C	22. B	32. B	42. D	52. B	62. D	72. B	82. C	92. B
3. C	13. D	23. D	33. D	43. C	53. B	63. A	73. A	83. A	93. A
4. A	14. A	24. C	34. D	44. C	54. C	64. B	74. C	84. B	94. B
5. C	15. D	25. D	35. D	45. A	55. D	65. D	75. C	85. D	95. A
6. C	16. A	26. D	36. C	46. B	56. D	66. B	76. B	86. B	96. B
7. D	17. D	27. A	37. A	47. B	57. C	67. C	77. D	87. B	97. C
8. B	18. B	28. D	38. D	48. C	58. C	68. B	78. B	88. A	98. C
9. B	19. C	29. D	39. C	49. D	59. C	69. B	79. D	89. C	99. A
10. C	20. B	30. B	40. A	50. A	60. B	70. A	80. D	90. C	100. B