Math Mammoth End-of-the-Year Test - Grade 6 South African Version

Grading

My suggestion for points per item is as follows. The total is 194 points. A score of 155 points is 80%.

Question	Max. points	Student score
Basic Operations		
1	2 points	
2	3 points	
3	2 points	
4	2 points	
subtotal		/ 9
Expressions and Equations		
5	4 points	
6	2 points	
7	2 points	
8	1 point	
9	2 points	
10	2 points	
11	2 points	
12	2 points	
13	2 points	
14	2 points	
15	1 point	
16	2 points	
17	2 points	
18	2 points	
19	4 points	
subtotal		/ 32
Decimals		
20	2 points	
21	2 points	
22	1 point	
23	2 points	
24	2 points	
25	1 point	
26	2 points	
27	2 points	
28a	1 point	
28b	2 points	
29	3 points	
subtotal		/ 20

Question	Max. points	Student score
Measuring Units		
30	3 points	
31	1 point	
32	2 points	
33	3 points	
34	6 points	
35	4 points	
subtotal		/ 19
Ratio		
36	2 points	
37	2 points	
38	2 points	
39	2 points	
40	2 points	
41	2 points	
42	2 points	
subtotal		/ 14
Percent		
43	3 points	
44	4 points	
45	2 points	
46	2 points	
47	2 points	
subtotal		/13

Question	Max. points	Student score
Prime Factorisation, GCF and LCM		
48	3 points	
49	2 points	
50	2 points	
51	2 points	
52	2 points	
subtotal		/11
Fractions		
53	3 points	
54	2 points	
55	2 points	
56	2 points	
57	3 points	
58	3 points	
subtotal		/15
Integers		
59	2 points	
60	2 points	
61	2 points	
62	4 points	
63	5 points	
64	6 points	
65	4 points	
subtotal		/25

Question	Max. points	Student score
Geometry		
66	1 point	
67	1 point	
68	3 points	
69	4 points	
70	2 points	
71a	1 point	
71b	3 points	
72	4 points	
73a	2 points	
73b	2 points	
subtotal		/23
Statistics		
74a	2 points	
74b	1 point	
74c	2 points	
75a	1 point	
75b	1 point	
76a	2 points	
76b	1 point	
76c	1 point	
76d	2 points	
subtotal		/13
TOTAL		/194

Math Mammoth End-of-the-Year Test - Grade 6
South African Version

Basic Operations

1. Two kilograms of ground cinnamon is packaged into
   bags containing 38 g each. There will also be some
   cinnamon left over. How many bags will there be?

2. Write the expressions using an exponent. Then solve.

   a. $2 \times 2 \times 2 \times 2 \times 2$

   b. five cubed

   c. ten to the seventh power

3. Write in normal form (as a number).

   a. $7 \times 10^7 + 2 \times 10^5 + 9 \times 10^0$

   b. $3 \times 10^8 + 4 \times 10^6 + 5 \times 10^5 + 1 \times 10^2$

4. Round to the place of the underlined digit.

   a. $6\,29\underline{9}\,504 \approx$ _____   **b.** $6\,609\,\underline{9}42 \approx$ _____

Expressions and Equations

5. Write an expression.

   a. 2 less than s **b.** the quantity $7 + x$, squared

   **c.** 5 times the quantity $y - 2$ **d.** the quotient of 4 and x^2

6. Evaluate the expressions when the value of the variable is given.

a. $40 - 8x$ when $x = 2$	**b.** $\dfrac{65}{p} \cdot 3$ when $p = 5$

7. Write an expression for each situation.

   a. You bought *m* packets of groundnuts for R2 each and paid with R50.
   What is your change?

   b. the area of a square with the side length *s*

8. Write an expression for the total length of the line segments, and simplify it.

   z   *z*   8   and   *x*   *x*   *x*
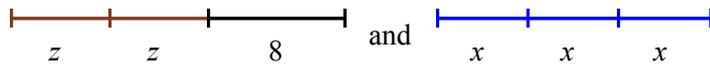
9. Write an expression for the perimeter of the figure, and simplify it.

$s + 6$
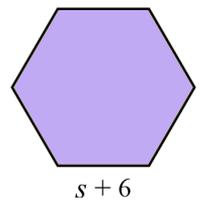
10. Write an expression for the area of the figure, and simplify it.

$6b$

$3b$
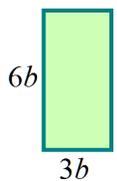
11. Simplify the expressions.

a. $9x - 6x$	**b.** $w \cdot w \cdot 7 \cdot w \cdot 2$

12. Multiply using the distributive property.

a. $7(x + 5) =$	**b.** $2(6p + 5) =$

13. Find the missing number in the equations.

a. _____ $(6x + 5) = 12x + 10$	**b.** $5(2h + $ _____ $) = 10h + 30$

14. Solve the equations.

| **a.** $\dfrac{x}{31} = 6$	**b.** $a - 8{,}1 = 2{,}8$

15. Which of the numbers 0, 1, 2, 3 or 4 make the equation $\dfrac{8}{y^2} = 2$ true?

16. Write an equation EVEN IF you could easily solve the problem without an equation! Then solve the equation.

   The value of a certain number of 20-cent coins is 1680 cents. How many 20-cent coins are there?

17. Write an inequality for each phrase. You will need to choose a variable to represent the quantity in question.

   a. Eat at most 5 pieces of bread.

   b. You have to be at least 21 years of age.

18. Write an inequality that corresponds to the number line plot.

24 25 26 27 28 29 30 31 32 33 34 35 36	2 3 4 5 6 7 8 9 10 11 12 13 14
a.	**b.**
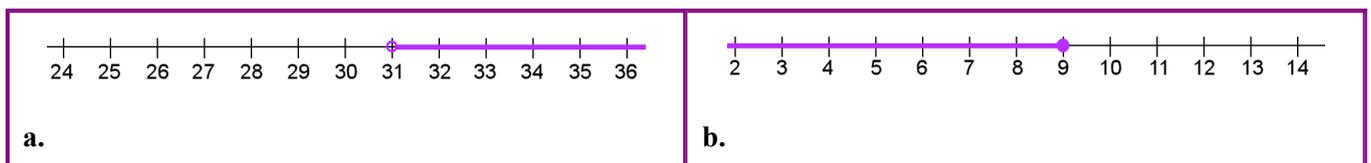
19. An automobile is travelling at a constant speed of 80 kilometres per hour. Consider the variables of time (t), measured in hours, and the distance travelled (d), measured in kilometres.

   a. Fill in the table.

t (hours)	0	1	2	3	4	5	6
d (km)							

   b. Plot the points on the coordinate grid.

   c. Write an equation that relates t and d.

   d. Which of the two variables is the independent variable?

6
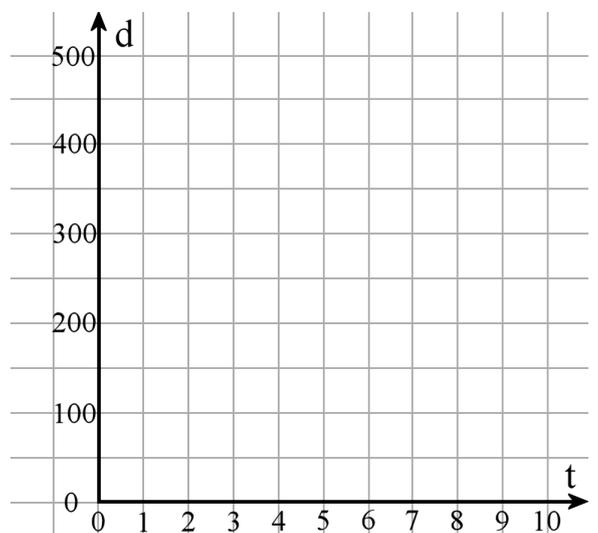
Decimals

20. Write as decimals.

    a. 13 millionths   **b.** 2 and 928 ten-thousandths

21. Write as fractions or mixed numbers.

    a. 0,00078   **b.** 2,000302

22. Find the value of the expression $x + 0{,}07$ when x has the value 0,0002.

23. Calculate in your head.

a. $0{,}8 \div 0{,}1 =$	**b.** $0{,}06 \times 0{,}008 =$

24. **a.** Estimate the answer to $7{,}1 \times 0{,}0058$.

    b. Calculate the exact answer.

25. What number is 22 ten-thousandths more than 1 1/2?

26. Multiply or divide.

a. $10^5 \times 0{,}905 =$	**b.** $24 \div 10^4 =$

27. Divide, and give your answer as a decimal. If necessary, round the answers to three decimal digits.

a. $175 \div 0{,}3$	**b.** $\dfrac{2}{9}$

28. Ansie bought 3/4 kg of oranges, which cost R12,80 per kg.

   a. Estimate the cost.

   b. Find the exact amount she had to pay.

29. Amanda and Bongeka bought three toy cars for their three cousins.
    The price for one car was R19,80. Value added tax totalling R8,30 was added to the total
    cost. The two girls shared the total cost equally. How much did each girl pay?

Measuring Units   *A calculator is allowed in this section.*

30. How many kilometres is 60 000 centimetres?

31. A big coffee pot makes 2 litres of coffee.
    How many 200-ml servings can you get from that?

32. A packet of 20 milk chocolate candies costs R72. Each candy weighs 25 g.
    Calculate how much one kilogram of these chocolate candies would cost (price per kilogram).

33. Convert the measurements. You can write the numbers in the place value charts to help you.

    a. 39 dl = _____ L   **b.** 15 400 mm = _____ m

    c. 7,5 hm = _____ cm   **d.** 597 hl = _____ L

    e. 7,5 hg = _____ kg   **f.** 32 g = _____ cg

kl	hl	dal	l	dl	cl	ml

kg	hg	dag	g	dg	cg	mg

km	hm	dam	m	dm	cm	mm

34. **a.** One brick is 215 mm long. How many of these bricks,
    put end to end, will cover a 5,15 metre wall?

    b. Calculate the answer to the previous question again,
    assuming 1 cm of mortar is laid between the bricks.

Ratio

35. **a.** Draw a picture where there are a total of ten squares,
    and for each two squares, there are three triangles.

    b. Write the ratio of squares to all triangles,
    and simplify this ratio to the lowest terms.

36. Write ratios of the given quantities. Then, simplify the ratios. You will need to *convert* one quantity so it has the same measuring unit as the other.

a. 3 kg and 800 g	**b.** 2,4 m and 100 cm

37. Express these rates in the lowest terms.

a. R56 : 16 kg	**b.** There are six teachers for every 108 students.

38. Change to unit rates.

a. R20 for five bars of soap	**b.** 72 kilometres in half an hour

39. **a.** It took 7 hours to mow four equal-sized lawns. At that rate, how many lawns could be mowed in 35 hours? You can use the table below to help.

Lawns					
Hours					

    b. What is the unit rate?

40. Joe and Muzi also worked on a project unequally. They decided to divide their pay in a ratio of 3:4 (3 parts for Joe, 4 parts for Muzi). The total pay was R280. Calculate how much Muzi got.

41. Use the given ratios to convert the measuring units. If necessary, round the answers to three decimal digits.

a. Use $1 = \dfrac{1.6093 \text{ km}}{1 \text{ mi}}$ and convert 7.08 miles to kilometres.

7.08 mi = _____

b. Use $1 = \dfrac{1 \text{ qt}}{0.946 \text{ L}}$ and convert 4 litres to quarts.

4 L = _____

Percent

42. Write as percentages, fractions and decimals.

a. _____ % = $\dfrac{35}{100}$ = _____

b. 9% = $\dfrac{}{}$ = _____

c. _____ % = $\dfrac{}{}$ = 1,05

43. Fill in the table, using mental maths.

	510
1% of the number	
5% of the number	
10% of the number	
30% of the number	

44. A soccer ball is discounted by 40%. The normal price is R65.
    What is the discounted price?

45. A shop has sold 90 notebooks, which is 20% of all the notebooks they had.
    How many notebooks did the shop have at first?

46. Jeanny has read 17 of the 20 books she borrowed from the library.
    Of the books she borrowed, what percentage has she read?

Prime Factorisation, GCF and LCM

47. Find the prime factorisation of the following numbers.

a. 45 / \	**b.** 78 / \	**c.** 97 / \

48. Find the least common multiple of these pairs of numbers.

a. 2 and 8	**b.** 9 and 6

49. Find the greatest common factor of the given number pairs.

a. 30 and 16	**b.** 45 and 15

50. List three different multiples of 28 that are more than 100 and less than 200.

51. First, find the GCF of the numbers. Then factor the expressions using the GCF.

a. The GCF of 18 and 21 is _____

$18 + 21 =$ ____ · ____ + ____ · ____ = ____ (____ + ____)

b. The GCF of 56 and 35 is _____

$56 + 35 =$ ____ (____ + ____)

Fractions

52. Solve.

a. $\frac{4}{5} \div \frac{1}{5}$	**b.** $3\frac{1}{8} \div 1\frac{1}{2}$	**c.** $4 \div \frac{5}{7}$

53. Write a division sentence, and solve.

How many times does ⬤ go into ⬤⬤⬤⬤ ?
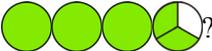
54. Write a real-life situation to match this fraction division: $1\frac{3}{4} \div 3 = \frac{7}{12}$

55. How many 3/4-kilogram bags of rice can you get from 7 1/2 kilograms of rice?

56. A rectangular room measures 3 3/4 metres by 4 2/3 metres. It is divided into three equal parts. Calculate the area of one of those parts.

57. The perimeter of a rectangular screen is 39 1/2 centimetres, and the ratio of its width to its height is 3:2. Find the width and height of the screen.

Integers

58. Compare the numbers, writing **<** or **>** in the box.

    a. 0 ☐ −3   **b.** −2 ☐ −8

59. Write a comparison to match each situation (with < or >).+

    a. The temperature −7°C is warmer than −12°C.

    b. Hannes has R5. Elize owes R5.

60. Find the difference between the two temperatures.

    a. −13°C and 10°C   **b.** −9°C and −21°C

61. Write using mathematical symbols, and simplify (solve) if possible.

    a. the opposite of 7   **b.** the absolute value of −6

    c. the absolute value of 5   **d.** the absolute value of the opposite of 6

62. **a.** Plot the point (−5, 3).

    b. Reflect the point in the *x*-axis.

    c. Now, reflect the point you got in (b) in the *y*-axis.

    d. Join the three points with line segments.
    What is the area of the resulting triangle?
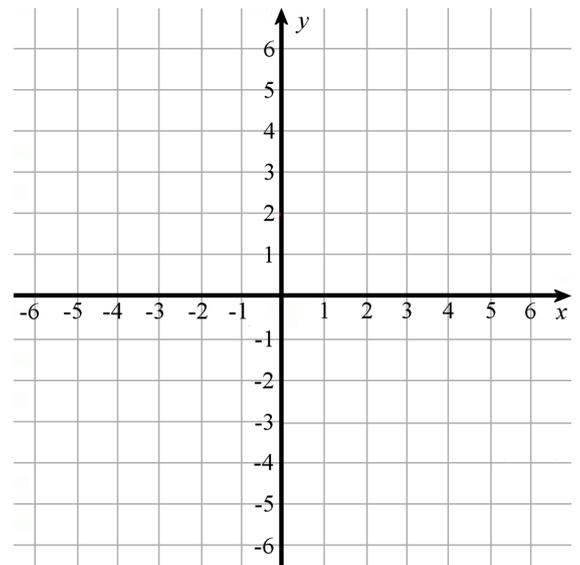
63. Draw a number line jump for each addition or subtraction sentence, and solve.

    a. −2 + 5 = _____

    b. −2 − 4 = _____

    c. −1 − 5 = _____
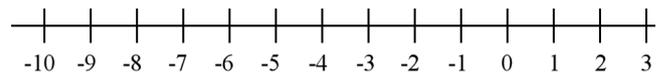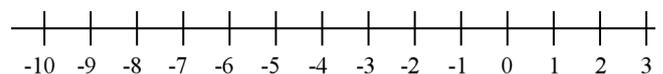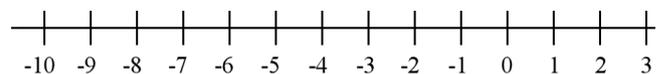
64. Write an addition or subtraction in the box to match each situation, and fill in the blanks.

   a. Lunga has saved R10. He wants to buy balloons for R14.
   That would make his money situation to be _____.

   _____

   b. A fish was swimming at the depth of 2 m. Then it sank 1 m.
   Now he is at the depth of _____ m.

   _____

Geometry

65. Draw in the grid a right triangle with a base of 4 units and a height of 3 units.

   Calculate its area.
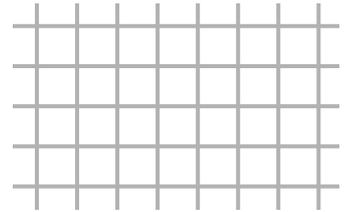
66. Draw in the grid a parallelogram with an area of 15 square units.
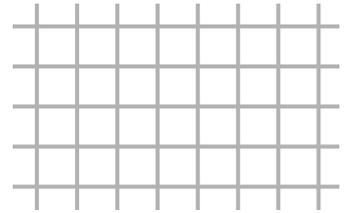
67. Find the area of this polygon, in square units.
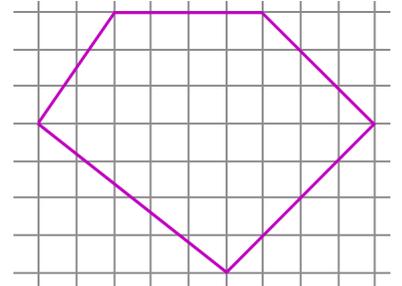
68. Draw a quadrilateral in the grid with vertices
   (−5, 5), (−5, −3), (2, −1) and (2, 4).

   What is the quadrilateral called?

   Find its area.
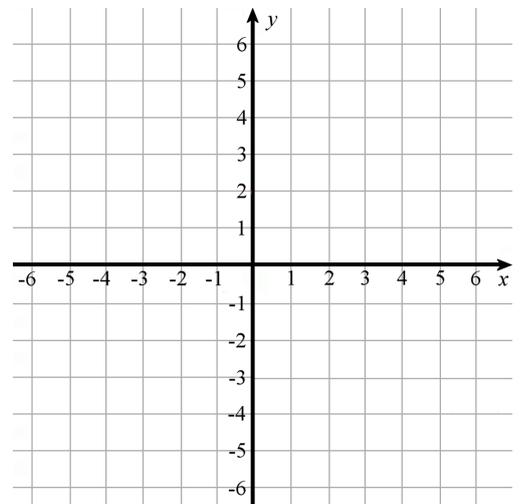
69. Name this solid. Draw a sketch of its net.
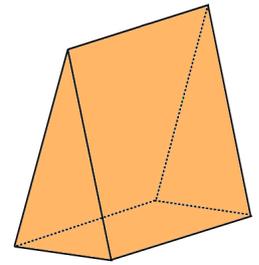
70. **a.** Name the solid that can be built from this net.

   b. Calculate its surface area.
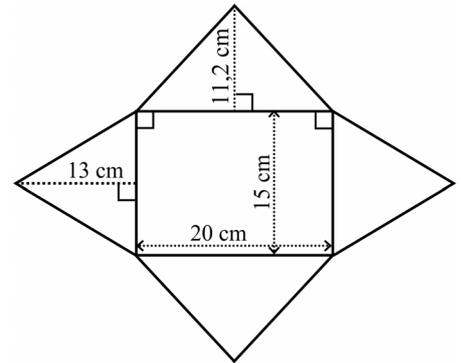
71. The edges of each little cube measure **1/2 cm**. What is the total volume of these figures, in cubic units?
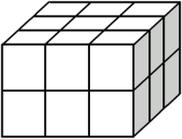
a.
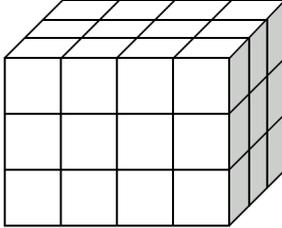
b.

72. A box containing a construction toy measures 4 2/5 cm by 21 3/5 cm by 15 cm.

   a. Calculate its volume.

   b. How many of these boxes fit into a crate with the inside measurements of 30 cm by 30 cm by 30 cm?

Statistics

73. **a.** Make a stem-and-leaf plot of this data.

    55 59 61 62 64 65 65 68 69 70 72 74 77 83 89 94

    (The ages of people in a senior chess club)

    b. Find the median.

    c. Find the interquartile range.

Stem	Leaf

74. **a.** Describe the shape of this distribution.

    b. Which measure of centre would be best to describe this distribution?

Prices of Books at a Children's Bookstore

75. **a.** Create a dot plot from this data.

    9 10 5 6 4 8 7 3 8 1 7 7 5 7 8 9 5 6 6 7

    (points on a maths quiz of a group of students)

    b. Describe the shape of the distribution.

    c. Describe the spread of the data.

    d. Choose a measure of centre to describe the data, and determine its value.