Junior High Math
Study Guide
Cycle 1

Correct answers are in bold

Operations with Decimals

1. Solve. 34.02 – 0.3 =
   A. 33.72 B. 34.32 C. 33.92 D. 33.02

2. Solve. 9 x 0.1 – 0.3 =
   A. .6 B. .3 C. .9 D. .12

Operations with Fractions

3. Solve. 4/5 – 2/5 + 1=
   A. 7/5 B. 5/5 C. 6/5 D. 9/5

4. Solve. 1/2 ÷2/3 – 1/4 =
   A. 1/2 B. 1/4 C. 3/4 D. 2/3

Integers and Rational Numbers

5. Write -12 3/20 as a decimal.
   A. -12.15 B. .12.15 C. -15.12 D. 15.12

6. Write 3 ¾ as a decimal.
   A. 3.75 B. 75.3 C. -3.75 D. -75.3

Rational Numbers

7. Which sign makes the statement true. -3/4 _____ -7 3/4
   A. > B. < C. = D. ≤

8. Which sign makes the statement true. -2 4/5 _____ 1
   A. < B. > C. = D. ≥

Adding and Subtracting Integers

9. Solve. -1 + -4 =
   A. -5 B. 5 C. -3 D. 3

10. Solve. -10 + -2 =
    A. -12 B. 12 C. -8 D. 8

Adding and Subtracting Integers

11. Solve. -3 + -13 + 3 +-11 =
    A. -24 B. -23 C. -25 D. -22

12. Solve. 15 + -9 + 3 =
    A. 9 B. 7 C. 8 D. 6

Multiplying and Dividing integers

13. Solve. -6 x -11 =
    A. 66 B. -66 C. -17 D. -5

14. Solve. -63 ÷ 9 =
    A. -7 B. 7 C. -9 D. 8

Operations with Integers and Rational Numbers

15. Solve. -3.8 - -2.8 =
A. -1.0 B. -6.6 C. 1.0 D. -5.6

16. Solve. -3 9/10 - -4 1/2 =
A. 3/5 B. -3/5 C. 9/10 D. -9/10

Operations with Rational Numbers

17. Solve. 6.5 ÷ -1 =
A. -6.5 B. 6.5 C. -5.5 D. 5.5

18. Solve. -2/5 ÷ -4 =
A. 1/10 B. -1/10 C. 2/5 D. -1/2

Ratios and Unit Rates

19. A 4-meter roll of white paper costs $1.52. What is the unit price?
A. .38 B. .25 C. .48 D. .76

20. A 5-pack of jump ropes costs $19.50. What is the unit price?
A. $3.90 B. $2.50 C. $3.00 D. $4.50

Proportions

21. Solve for g. 20/u = 5/1
A. 4 B. 5 C. 10 D. 20

22. Solve for g. g/12 = 12/16
A. 9 B. 12 C. 16 D. 6

Proportional Relationships

23. Use y = 1/2x to find the missing proportion. 2 = 1; 4 = 2; 6 = 3; 8 = ?.
A. 4 B. 2 C. 6 D. 8

24. Use y = 1/3x to find the missing proportion. 0 = 0; 3 = 1; 6 = 2; 9 = ?.
A. 3 B. 6 C. 4 D. 5

Proportional Relationships and Percents

25. Which is the most accurate way to estimate 67% of 25?
A. 2/3 of 24 B. 1/2 of 28 C. 2/3 of 28 D. 1/2 of 24

26. Which is the most accurate way to estimate 35% of 25?
A. 1/3 of 24 B. 1/4 of 24 C. 1/4 of 21 D. 1/3 of 21

Percents

27. What is 70% of 100?
A. 70 B. 7 C. 30 D. 170

28. What is 90% of $20?
A. $18 B. $2 C. $9 D. $20

Percents

29. Estimate the amount of the tip by rounding the bill to the nearest dollar before calculating: 20% tip on a bill of $58.53.
    A. $11.80 B. $10.00 C. $11.00 D. $12.50

30. Estimate the amount of the tip by rounding the bill to the nearest dollar before calculating: 20% tip on a bill of $12.16.
    A. $2.40 B. $2.00 C. $3.00 D. $1.20

Percents

31. Becky buys a CD player during a 75% off sale. If Becky pays $4, what was the original price?
    A. $16.00 B. $12.00 C. $20.00 D. $30.00

32. Colette buys a fountain during a 50% off sale. If Colette pays $290, what was the original price?
    A. $580 B. $145 C. $290 D. $600

Scale Drawings and Variable Expressions

33. Evaluate the expression for $s = 13$ in 7 + s.
    A. $20 B. $19 C. $18 D. $21

34. Kari made a scale drawing of an apartment. The scale she used was 1 inch = 1 foot. What is the drawing's scale factor?
    A. 1/12 B. 1/1 C. 1/10 D. 12/1

35. Jayla drew a scale drawing of a neighborhood park. The scale of the drawing was 1 inch = 1 yard. What is the drawing's scale factor?
    A. 1/36 B. 1/12 C. 1/24 D. 1/3

Variable Expressions

36. Solve. 4x + 8 + 2x
    A. 6x + 8 B. 14x C. 4x + 10 D. 12x + 2

37. Solve. 5x + 2x + 3
    A. 7x + 3 B. 10x C. 5x + 5 D. 5x + 7

Variable Expressions

38. Solve. (6a + 7) - (6a + 1).
    A. 6 B. 12a + 6 C. 6a + 8 D. 7a + 6

39. Solve. (5u + 4) + (9u + 2).
    A. 14u + 6 B. 14u + 2 C. 5u + 6 D. 9u + 6

Variable Expressions

40. Which expression is equivalent to $2x + 4 + 3x$?
    A. 5x + 4 B. 5x C. 6x + 3 D. 6x + 7

41. Which expression is equivalent to 3 + 6x + 1?
    A. 6x + 4 B. 3x +7 C. 9x + 1 D. 7x + 3

Solving Equations

42. Solve. $2(y + 3) = 14$.
    A. 4 B. 5 C. 8 D. 2

43. Solve. $3(k + 4) = 18$.
    A. 2 B. 6 C. 3 D. 4

Solving Equations and Inequalities

44. Solve. $g/4 – 2 = 1$.
    A. 12 B. 3 C. 16 D. 9

45. Solve. $6 = 2r - 10$.
    A. 8 B. 6 C. 16 D. 4

46. Solve. $2u - 5 = 11$.
    A. 8 B. 16 C. 6 D. 5

Solving Inequalities

47. Solve. $2q + 2 > 10$.
    A. $q > 4$ B. $q < 4$ C. $q \geq 4$ D. $q = 4$

48. Solve. $10n - 1 \geq -11$.
    A. $n \geq -1$ B. $n > -1$ C. $n \leq -1$ D. $n = -1$

Angles and Triangles

49. An angle measures 50º. What does its vertical angle, s, measure?
    A. 50º B. 130º C. 180º D. 80º

50. A right angle has been divided into two. One angle measures 50º. What does the other angle measure?
    A. 40º B. 90º C. 10º D. 60º

51. A straight angle has been divided into two. One angle measures 60º. What does the other angle measure?
    A. 120º B. 140º C. 30º D. 40º

Area and Circles

52. A triangle's height is 4 in with a base of 4 in. What is its area?
    A. 8 square in B. 16 square in C. 32 square in D. 15 square in

53. A square has a side that measures 5 yards. What is its area?
    A. 25 square yd B. 20 square yd C. 10 square yd D. 15 square yd

Circles and Three-Dimensional Figures

54. The radius of a circle is 1 cm. What is its area?
    A. 3.14 square cm B. 16.14 square cm C. 6.14 square cm D. 4.14 square cm

55. The radius of a circle is 2 cm. What is its area?
    A. 12.56 square cm B. 17.56 square cm C. 12.65 square cm D. 17.65 square cm

56. The radius of a circle is 4 in. What is its area?
    A. 50.24 square in B. 52.24 square in C. 50.42 square in D. 55.65 square in

Volume and Surface Area

57. A cube has a height of 8 mm, a length of 8 mm, and a width of 8 mm. What is the volume?
    A. 512 mm^3 B. 502 mm^3 C. 513 mm^3 D. 522 mm^3

58. A rectangular prism has a height of 8 cm, a length of 6 cm, and a width of 4 cm. What is the volume?
    A. 192 cm^3 B. 96 cm^3 C. 128 cm^3 D. 48 cm^3

Statistics and Graphs

59. Jason started doing sit-ups to prepare for the school fitness test. On 8 days he did: 7 sit-ups, 6 sit-ups, 6 sit-ups, 8 sit-ups, 6 sit-ups, 8 sit-ups, 9 sit-ups, 6 sit-ups. What was the mode of the numbers of sit-ups he did?
    A. 6 B. 8 C. 9 D. 7

60. An oral surgeon is tracking how many patients were referred to him by various local dentists. In the past year, 6 dentists made the following number of referrals: 9 patients, 7 patients, 8 patients, 6 patients, 8 patients, 9 patients. What was the range of the numbers of referrals?
    A. 3 B. 4 C. 6 D. 7

61. A Quality Assurance Engineer is measuring the diameter of some newly manufactured pipes. She measured 6 pipes and noted diameters of: 5 cm, 5 cm, 5 cm, 5cm, 6 cm, 4 cm. What is the mean diameter of the pipes?
    A. 5 B. 4.5 C. 5.5 D. 6

Statistics and Graphs

62. In the following number set, the mode is 16. What could p be? 12, 19, 9, 16, 20, p
    A. 16 B. 12 C. 19 D. 20

63. In the following number set, the median is 15. What could h be? 6, 15, 18, h, 16
    A. 6 B. 19 C. 16 D. 18

Probability

64. If you roll a 6-sided die 6 times, what is the best prediction possible for the number of times you will roll a six?
    A. 1 B. 6 C. 5 D. 3

65. The spinner has two red spaces, 1 blue space, and 1yellow space. If you spin the spinner 12 times, what is the best prediction possible for the number of times it will land on blue?
    A. 3 B. 1 C. 4 D. 6

66. On the ground there are 5 blue marbles, 1 pink marble and 1 purple marble. You select a marble without looking and then put it back. If you do this 7 times, what is the best prediction possible for the number of times you will pick a pink marble?
    A. 1 B. 3 C. 7 D. 4

67. Fraction Multiplication

What is 3/4 × 8/9 in simplest form?

A) 2/3

B) 1/2

C) 1/3

D) 2/5

Correct Answer: A) 2/3

68. Percent Problem

A pair of shoes costs $80, and they are on sale for 25% off. What is the sale price?

A) $60

B) $65

C) $70

D) $75

Correct Answer: A) $60

69. Algebraic Expression

Simplify: 3x + 2x - 4 + 6

A) 5x + 2

B) 5x + 6

C) 5x - 2

D) 5x - 6

Correct Answer: A) 5x + 2

70. Data Analysis

The number of cookies baked by a bakery each day for a week are: Monday - 120, Tuesday - 150, Wednesday - 100, Thursday - 130, Friday - 160. What is the average number of cookies baked per day?

A) 120

B) 130

C) 140

D) 150

Correct Answer: B) 130

71. Proportional Relationships

A car travels 120 miles in 3 hours. How far will the car travel in 7 hours at the same speed?

A) 210 miles

B) 280 miles

C) 300 miles

D) 320 miles

Correct Answer: B) 280 miles

72. **Percent Increase**

The price of a jacket increased from $50 to $65. What is the percentage increase from the original price?

A) 20%

B) 25%

C) 30%

D) 15%

Correct Answer: C) 30%

73. **Volume of a Cylinder**

A cylinder has a radius of 3 cm and a height of 7 cm. What is its volume? Use π=3.14.

- **A)** 197.82 cm^3
- **B)** 188.40 cm^3
- **C)** 198.00 cm^3
- **D)** 205.50 cm^3

Correct Answer: A) 197.82 cm

74. **Area of a Triangle**

A triangle has a base of 8 cm and a height of 10 cm. What is its area?

- **A)** 80 cm^2
- **B)** 40 cm^2
- **C)** 50 cm^2
- **D)** 45 cm^2

Correct Answer: B) 40 cm^2

75. **Pythagorean Theorem**

A right triangle has legs measuring 6 cm and 8 cm. What is the length of the hypotenuse?

- **A)** 10 cm
- **B)** 12 cm
- **C)** 14 cm
- **D)** 15 cm

Correct Answer: A) 10 cm

76. Scientific Notation

Express 0.000456 in scientific notation.

A) 4.56×10^{-3}

B) 4.56×10^{-4}

C) 45.6×10^{-5}

D) 0.456×10^{-2}

Correct Answer: B) 4.56×10^{-4}

77. Scatterplots

Which scatterplot shows a negative correlation?

- **A)** Points sloping upwards from left to right
- **B)** Points sloping downwards from left to right
- **C)** Randomly scattered points
- **D)** Points in a horizontal line

Correct Answer: B) Points sloping downwards from left to right

78. Solving Equations with Variables on Both Sides

Solve for x: $5x + 7 = 3x + 15$

A) $x = 3$

B) $x = 4$

C) $x = -4$

D) $x = -3$

Correct Answer: B) $x = 4$

Algebra

79. Solve for x: $2x + 5 = 17$

a) 5

b) 6

c) 7

d) 8

Correct Answer: b) 6

80. Simplify: (2a - 3b) - (-4a + 2b)

a) -2a - 5b

b) 2a - 5b

c) 6a - 5b

d) 6a - b

Correct Answer: c) 6a - 5b

Geometry

81. What is the area of a circle with radius 5 cm? (Use π≈3.14\pi ≈ 3.14π≈3.14)
    a) 31.4 cm²
    b) 62.8 cm²
    c) 78.5 cm²
    d) 157 cm²
    Correct Answer: c) 78.5 cm²

82. **What is the perimeter of a rectangle with length 8 cm and width 5 cm?**
    a) 13 cm
    b) 26 cm
    c) 40 cm
    d) 80 cm
    Correct Answer: b) 26 cm

83. **If the ratio of boys to girls in a class is 3:5 and there are 24 students in total, how many boys are in the class?**
    a) 8
    b) 9
    c) 10
    d) 12
    Correct Answer: b) 9

Arithmetic and Fractions

84. Simplify: (2/3) ÷ (1/4)

a) 1/6

b) 3/4

c) 8/3

d) 16/3

Correct Answer: 8/3

85. What is the value of: $3^4 \div 3^2$

a) 3

b) 6

c) 9

d) 27

Correct Answer: 9

86. Solve for x: 5^x = 125

a) 2

b) 3

c) 4

d) 5

Correct Answer: 3

87. Solve for x: 3x - 7 > 5

a) x > 3

b) x > 4

c) x < 3

d) x < 4

Correct Answer: x > 4

88. Simplify: √64 + √36

a) 10

b) 12

c) 14

d) 16

Correct Answer: 10

89. Solve for x: $x^2 - 4 = 0$

a) x = 2 or x = -2

b) x = 4 or x = -4

c) x = 0 or x = 4

d) x = -4 or x = 0

Correct Answer: x = 2 or x = -2

90. What is the surface area of a cube with side length 5 cm?
a) 25 cm^2
b) 75 cm^2
c) 125 cm^2
d) 150 cm^2
Correct Answer: d) 150 cm^2

91. **What is the measure of an angle that is supplementary to a 65° angle?**
a) 115°
b) 125°
c) 135°
d) 145°
Correct Answer: b) 115°

92. **A die is rolled twice. What is the probability of rolling a 4 on both rolls?**
a) 1/6
b) 1/12
c) 1/36
d) 1/18
Correct Answer: c) 1/36

93. **What is the term for the result of a multiplication problem?**
a) Sum
b) Product
c) Quotient
d) Difference
Correct Answer: b) Product

94. **What is the term for the result of a division problem?**
a) Sum
b) Product
c) Difference
d) Quotient
Correct Answer: d) Quotient

Geometry Vocabulary

95. **What is the term for a polygon with six sides?**
    a) Hexagon
    b) Pentagon
    c) Heptagon
    d) Octagon
    Correct Answer: a) Hexagon

96. **What is the term for the longest side of a right triangle?**
    a) Leg
    b) Base
    c) Hypotenuse
    d) Altitude
    Correct Answer: c) Hypotenuse

Algebra Vocabulary

97. **What is the term for a number that does not change?**
    a) Variable
    b) Coefficient
    c) Constant
    d) Function
    Correct Answer: c) Constant

98. **What is the term for a mathematical sentence that shows two expressions are equal?**
    a) Inequality
    b) Equation
    c) Expression
    d) Function
    Correct Answer: b) Equation

Measurement Vocabulary

99. **What is the term for the amount of space inside a three-dimensional object?**
    a) Perimeter
    b) Area
    c) Surface Area
    d) Volume
    Correct Answer: d) Volume

100. **What is the term for the total length of the sides of a polygon?**
    a) Volume
    b) Area
    c) Perimeter
    d) Surface Area
    Correct Answer: c) Perimeter