

## Grade 7 Math Benchmark 4

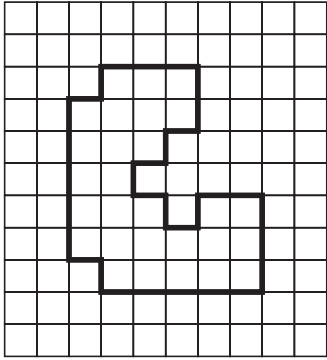
Read each question and choose the best answer. For questions 1 and 2, you are not permitted to use a calculator.



1. Karen went to the grocery store and her purchase totaled \$38.51. If she paid with a \$50 bill, which is the **best** estimate of her change?
- A \$10  
B \$15  
C \$20  
D \$40
2. Dominic went to lunch with his father, and the bill came to a total of \$17.65. If they want to leave a 15% tip for the server, **about how much** tip should they leave?
- A \$1.70  
B \$1.80  
C \$2.55  
D \$2.70

Do not return to the first part of the assessment  
after beginning question 3.

3. What is the perimeter of the figure below?



Each  $\square = 1$  square unit.

- A 20 units  
 B 26 units  
 C 28 units  
 D 32 units
4. The table below shows the diameters and circumferences of some U.S. coins, rounded to the nearest tenth of a millimeter.

Coin	Diameter (millimeters)	Circumference (millimeters)
Penny	19.1	60.0
Nickel	21.2	66.6
Dime	17.9	56.2
Quarter	24.3	76.3

What is the **best** estimate of the ratio of circumference to diameter?

- A 2:1  
 B 3:1  
 C 4:1  
 D 6:1

5. A graphic designer is going to reduce a photograph using a scale factor of  $0.25\times$ . The original photograph measures 24 inches  $\times$  16 inches. What will be the dimensions of the reduced photograph?

- A 6 inches  $\times$  4 inches  
 B 18 inches  $\times$  12 inches  
 C 30 inches  $\times$  20 inches  
 D 42 inches  $\times$  28 inches

6. What is the **median** of the data set below?

21, 74, 51, 62, 31, 66, 47, 49, 31

- A 31  
 B 48  
 C 49  
 D 53

7. There are 211 people attending a concert. Of those people, 97 are seated in premium seats. Which proportion can be used to find the percent of attendees who are sitting in premium seats?

- A  $\frac{97}{100} = \frac{x}{211}$   
 B  $\frac{97}{211} = \frac{x}{100}$   
 C  $\frac{97}{x} = \frac{100}{211}$   
 D  $\frac{211}{97} = \frac{x}{100}$

8. Solve:

$$4 \times 5 - 4^2 \div 2$$

- A -22  
B 2  
C 12  
D 18
9. The table below shows the side lengths and areas of several different squares.

Side Length (in inches)	Area (in square inches)
2	4
3	9
4	16

What is the area of a square with a side length of 8 inches?

- A 16 square inches  
B 24 square inches  
C 32 square inches  
D 64 square inches

10. A scientist performed an experiment and recorded the following temperatures in degrees Celsius.

10, 20, 21, 24, 12, 21, 16, 21, 18, 17

What is the **median** of the scientist's data set?

- A 14°C  
B 18°C  
C 19°C  
D 21°C
11. Stacey drove her car 50 miles and used 2 gallons of gas. The gas tank in her car has a capacity of 12 gallons. Use the proportion below to find  $x$ , the total number of miles Stacey can drive with a full tank of gas.

$$\frac{2}{50} = \frac{12}{x}$$

- A 60  
B 124  
C 300  
D 600
12. What is 75% of 96?
- A 21  
B 48  
C 64  
D 72

13. The table below shows the number of computers and the number of students in three schools.

School	Number of Students	Number of Computers
Eastern Middle School	858	330
Willbrook Middle School	624	260
Stevenson Middle School	985	394

Which statement is **not** true about this data?

- A Stevenson Middle School has the most computers.
- B Eastern Middle School has the fewest computers.
- C Willbrook Middle School has the least number of students per computer.
- D Eastern Middle School has the greatest number of students per computer.

14. Solve:

$$3 + 2 \times 6 - 12 \div 6$$

- A -5
- B 3
- C 11
- D 13

15. Solve for  $x$  in the proportion below.

$$\frac{6}{7} = \frac{x}{21}$$

- A 14
- B 18
- C 20
- D 22

16. Look at the pattern below.

7, 14, 21, 28,...

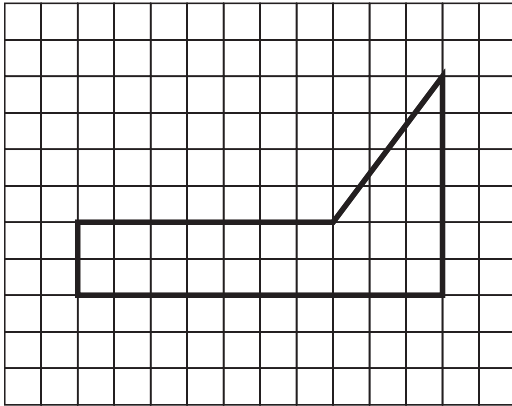
Which rule can be used to find any number in the pattern, if  $n$  represents the number's position in the pattern?

- A  $n + 7$
- B  $n - 7$
- C  $\frac{7}{n}$
- D  $7n$

17. Mario has a bag that contains 36 marbles. In the bag, there are 9 red marbles, 5 blue marbles, 10 yellow marbles, and 12 purple marbles. What is the ratio of red to purple marbles?

- A 1:3
- B 1:4
- C 3:4
- D 4:3

18. Look at the figure below.



Each  $\square$  = 1 square unit.

What is the area of the figure?

- A 20 square units
- B 26 square units
- C 30 square units
- D 32 square units

19. A machine is able to seal 70 cans of soup every 2 minutes. Use a proportion to find out how many cans of soup the machine can seal in 15 minutes.

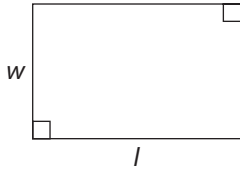
- A 170
- B 525
- C 1,050
- D 2,100

20. Gary wants to deposit 25% of his weekly paycheck into a savings account. Which of these shows how he can calculate the amount he will deposit into his savings account?

- A paycheck  $\xrightarrow{\times 0.25}$  savings
- B paycheck  $\xrightarrow{- 0.25}$  savings
- C paycheck  $\xrightarrow{\div 0.25}$  savings
- D paycheck  $\xrightarrow{+ 0.25}$  savings

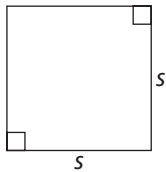
# Mathematics Reference Sheet

You may use the calculator  $\pi$  or the number 3.14.

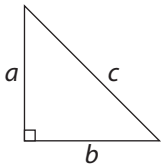


$$P = 2l + 2w$$

$$A = lw$$

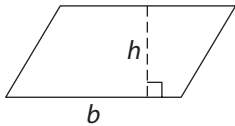


$$A = s \cdot s$$

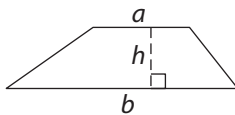


Pythagorean Theorem:

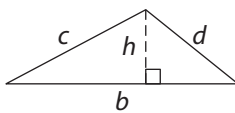
$$a^2 + b^2 = c^2$$



$$A = bh$$

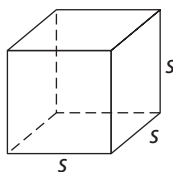


$$A = \frac{1}{2}h(a + b)$$



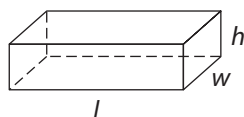
$$P = b + c + d$$

$$A = \frac{1}{2}bh$$



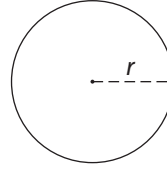
$$SA = 6s^2$$

$$V = s \cdot s \cdot s$$



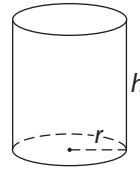
$$SA = 2lw + 2lh + 2wh$$

$$V = lwh$$

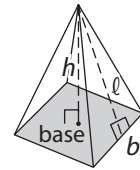


$$C = 2\pi r$$

$$A = \pi r^2$$



$$V = \pi r^2 h$$



$$V = \frac{1}{3}(\text{Area of the base}) \times h$$

## Metric Conversions:

- 1 kilometer = 1000 meters
- 1 hectometer = 100 meters
- 1 dekameter = 10 meters
- 1 meter
- 1 decimeter = 0.1 meter
- 1 centimeter = 0.01 meter
- 1 millimeter = 0.001 meter

## Customary Conversions:

- 1 yard (yd) = 3 feet
- 1 foot = 12 inches (in.)
- 1 pound = 16 ounces (oz.)
- 1 gallon (gal) = 4 quarts (qt)
- 1 quart = 2 pints (pt)
- 1 pint = 2 cups (c)
- 1 cup = 8 fluid ounces
- 1 day = 24 hours (hr)
- 1 hour = 60 minutes (min)
- 1 minute = 60 seconds (sec)



**This is the end of the test.**

**You may go back to check your work  
or answer questions you did not complete.**



Answer Key  
Grade 7 Math Benchmark 4

Item Number	Correct Answer	Performance Content Descriptor Measured	Eligible Content Measured
1	A	2.2.7.E.1	M7.A.3.1.1
2	D	2.2.7.D.1	M7.A.2.2.5
3	D	2.3.7.A.1	M7.B.2.1.1
4	B	2.3.7.A.4	M7.A.2.2.2
5	A	2.9.7.G.3	M7.A.2.2.5
6	C	2.6.7.B.3	M7.E.2.1.1
7	B	2.1.7.D.6	M7.A.2.2.1
8	C	2.2.7.A.2	M7.A.2.1.1
9	D	2.8.7.A.1	M7.D.1.1.1
10	C	2.6.7.B.3	M7.E.2.1.1
11	C	2.1.7.D.4	M7.A.2.2.2
12	D	2.1.7.D.1	M7.A.1.1.1
13	B	2.1.7.A.1	M7.A.2.2.3
14	D	2.2.7.A.2	M7.A.2.1.1
15	B	2.1.7.D.4	M7.A.2.2.2
16	D	2.8.7.A.1	M7.D.1.1.1
17	C	2.1.7.D.6	M7.A.2.2.1
18	B	2.3.7.A.1	M7.B.2.1.1
19	B	2.1.7.A.1	M7.A.2.2.3
20	A	2.1.7.D.1	M7.A.1.1.1