

Name:

Date:

1

Which number is irrational?

- (1)  $\sqrt{9}$                       (3) 0.3333  
(2)  $\sqrt{8}$                       (4)  $\frac{2}{3}$

2

On February 18, from 9 a.m. until 2 p.m., the temperature rose from  $-14^{\circ}\text{F}$  to  $36^{\circ}\text{F}$ . What was the total increase in temperature during this time period?

- (1)  $50^{\circ}$                       (3)  $32^{\circ}$   
(2)  $36^{\circ}$                       (4)  $22^{\circ}$

3

An equation of the line that has a slope of 3 and a  $y$ -intercept of  $-2$  is

- (1)  $x = 3y - 2$               (3)  $y = -\frac{2}{3}x$   
(2)  $y = 3x - 2$               (4)  $y = -2x + 3$

4

What is the value of  $\frac{x^2 - 4y}{2}$ , if  $x = 4$  and  $y = -3$ ?

- (1)  $-2$                       (3) 10  
(2) 2                      (4) 14

5

What is a common factor of  $x^2 - 9$  and  $x^2 - 5x + 6$ ?

- (1)  $x + 3$                       (3)  $x - 2$   
(2)  $x - 3$                       (4)  $x^2$

6

If  $a > 0$ , then  $\sqrt{9a^2 + 16a^2}$  equals

- (1)  $\sqrt{7a}$                       (3)  $5a$   
(2)  $5\sqrt{a}$                       (4)  $7a$

7

What is the sum of  $\frac{2}{x}$  and  $\frac{x}{2}$ ?

- (1) 1                              (3)  $\frac{4+x}{2x}$   
(2)  $\frac{2+x}{2x}$                       (4)  $\frac{4+x^2}{2x}$

8

If  $2x^2 - x + 6$  is subtracted from  $x^2 + 3x - 2$ , the result is

- (1)  $x^2 + 2x - 8$               (3)  $-x^2 + 2x - 8$   
(2)  $x^2 - 4x + 8$               (4)  $-x^2 + 4x - 8$

9

The expression  $(a^2 + b^2)^2$  is equivalent to

- (1)  $a^4 + b^4$                       (3)  $a^4 + 2a^2b^2 + b^4$   
(2)  $a^4 + a^2b^2 + b^4$               (4)  $a^4 + 4a^2b^2 + b^4$

10

In the coordinate plane, the points (2,2) and (2,12) are the endpoints of a diameter of a circle. What is the length of the radius of the circle?

- (1) 5                              (3) 7  
(2) 6                              (4) 10

11

What is the least common denominator of  $\frac{1}{2}$ ,  $\frac{2}{7x}$ , and  $\frac{5}{x}$ ?

- (1)  $9x$                               (3)  $14x$   
(2)  $2x$                               (4)  $14x^2$

12

If  $3x$  is one factor of  $3x^2 - 9x$ , what is the other factor?

- (1)  $3x$                                       (3)  $x - 3$   
(2)  $x^2 - 6x$                                 (4)  $x + 3$

13

If the mass of a proton is  $1.67 \times 10^{-24}$  gram, what is the mass of 1,000 protons?

- (1)  $1.67 \times 10^{-27}$  g                        (3)  $1.67 \times 10^{-22}$  g  
(2)  $1.67 \times 10^{-23}$  g                        (4)  $1.67 \times 10^{-21}$  g

14

Rashawn bought a CD that cost \$18.99 and paid \$20.51, including sales tax. What was the rate of the sales tax?

- (1) 5%                                        (3) 3%  
(2) 2%                                        (4) 8%

15

If the temperature in Buffalo is  $23^\circ$  Fahrenheit, what is the temperature in degrees Celsius? [Use the formula  $C = \frac{5}{9}(F - 32)$ .]

- (1)  $-5$                                         (3)  $-45$   
(2)  $5$    (4)  $45$

16

If  $f(x) = 4x^0 + (4x)^{-1}$ , what is the value of  $f(4)$ ?

- (1)  $-12$   
(2)  $0$   
(3)  $1 \frac{1}{16}$   
(4)  $4 \frac{1}{16}$

17

The expression  $\sqrt[4]{16a^8b^4}$  is equivalent to

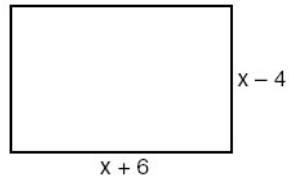
- (1)  $2a^2b$   
(2)  $2a^{\frac{3}{2}}b$   
(3)  $4a^2b$   
(4)  $4a^{\frac{3}{2}}b$

18

Brett was given the problem: "Evaluate  $2x^2 + 5$  when  $x = 3$ ." Brett wrote that the answer was 41. Was Brett correct? Explain your answer.

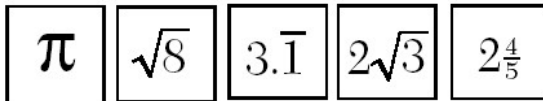
19

Express both the perimeter and the area of the rectangle shown in the accompanying diagram as polynomials in simplest form.



20

Kyoko's mathematics teacher gave her the accompanying cards and asked her to arrange the cards in order from least to greatest. In what order should Kyoko arrange the cards?



21

Solve for all values of  $q$  that satisfy the equation  $\sqrt{3q + 7} = q + 3$ .

The coordinates of the midpoint of  $\overline{AB}$  are  $(2,4)$ , and the coordinates of point  $B$  are  $(3,7)$ . What are the coordinates of point  $A$ ? [The use of the accompanying grid is optional.]

