1

Jessica wrote the equations below.

$$r = 27 \cdot n$$

$$s = 45 \cdot n$$

Which of the following expressions is equivalent to s - r?

A. 
$$(45 - 27)n$$

B. 
$$45(27 - n)$$

C. 
$$(45 - n)(27 - n)$$

D. 
$$(45 - 27)(n - n)$$

For all nonzero values of x and y, which of the following expressions **must** equal 0?

A. 
$$x^{0}(y^{0})$$

B. 
$$x^y - y^x$$

C. 
$$xy - yx$$

D. 
$$(x + y) + (x - y)$$

What is the value of the expression below?

$$\left(\sqrt{7}\right)^4$$

Mark your answer here: 3. (A) B (C) D

Mark your answer here: 2. ABCD

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Which of the following is equivalent to the expression below for all real values of n and k?

Mark your answer here: 4. (A) B) C) D

$$5^n \cdot 5^k$$

- A.  $5^{n+k}$
- B.  $5^{n-k}$
- C. 5<sup>nk</sup>
- D.  $5^{n \div k}$
- Which of the following equations does not have a real number solution?

Mark your answer here: 5. ABCD

- A. n + 1 = n
- B.  $n \cdot 1 = n$
- C. n + 0 = n
- D. n 0 = n
- Steve correctly multiplied 10 by its multiplicative inverse. Which of the following is the result of his multiplication?
- Mark your answer here: 6. ABCD

- A.  $\frac{1}{100}$
- B.  $\frac{1}{10}$
- C. 1
- D. 10

What value of *x* makes the equation below true?

Mark your answer here: 7. ABCD

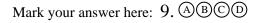
$$2^{x} = 8$$

- A. 2
- B. 3
- C. 4
- D. 6
- What is the value of the expression below?

Mark your answer here: 8. ABCD

$$\sqrt{6^2 + 8^2}$$

- A. 10
- B. 14
- C. 28
- D. 50
- Which of the following equations demonstrates the distributive property?



- A. 3x + 0 = 3x
- B. 3(xy) = (3x)y
- C. 3 + x = x + 3
- D. 3(x + y) = 3x + 3y

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Directions: For the problem below, use a separate piece of paper to write your answers. Your teacher will not count anything you write on this page.

10

Let the operation  $\blacklozenge$  be defined for all real numbers s and t as follows:

$$s \blacklozenge t = s + t - 2$$

For example, 4 • 8 = 4 + 8 - 2 = 10.

- a. What is the value of 3 + 5? Show your work.
- b. What is the value of 7 (-11)? Show your work.
- c. What is the value of y that makes the equation below true?

$$6 \blacklozenge y = 6$$

Show or explain how you got your answer.

d. Use the properties of operations on real numbers to show that  $x \diamond y = y \diamond x$  for all real numbers x and y.