

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

Mark your answer here: 1. A B C D

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

Mark your answer here: 2. A B C D

- 3 What is the value of the expression below?

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

- A. 7
- B. 28
- C. 49
- D. 98

Mark your answer here: 3. A B C D



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

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

- A. 5^{n+k}
- B. 5^{n-k}
- C. 5^{nk}
- D. $5^{n \div k}$

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

- 5 Which of the following equations does **not** have a real number solution?

- A. $n + 1 = n$
- B. $n \cdot 1 = n$
- C. $n + 0 = n$
- D. $n - 0 = n$

Mark your answer here: 5. (A)(B)(C)(D)

- 6 Steve correctly multiplied 10 by its multiplicative inverse. Which of the following is the result of his multiplication?

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

Mark your answer here: 6. (A)(B)(C)(D)



- 7 What value of x makes the equation below true?

$$2^x = 8$$

- A. 2
- B. 3
- C. 4
- D. 6

Mark your answer here: 7. (A)(B)(C)(D)

- 8 What is the value of the expression below?

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

- A. 10
- B. 14
- C. 28
- D. 50

Mark your answer here: 8. (A)(B)(C)(D)

- 9 Which of the following equations demonstrates the distributive property?

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

Mark your answer here: 9. (A)(B)(C)(D)



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.

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

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

For example, $4 \diamond 8 = 4 + 8 - 2 = 10$.

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

$$6 \diamond y = 6$$

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 .

