

**A.N.6: Evaluating Expressions 2: Evaluate expressions involving factorial(s), absolute value(s), and exponential expression(s)**

- 1 If  $t = -3$ , then  $3t^2 + 5t + 6$  equals
- 2 What is the value of the expression  $2x^3y$  when  $x = -2$  and  $y = 3$ ?
- 3 If  $a = 3$  and  $b = -1$ , what is the value of  $ab - b^2$ ?
- 4 If  $x = -4$  and  $y = 3$ , what is the value of  $x - 3y^2$ ?
- 5 What is the value of the expression  $-3x^2y + 4x$  when  $x = -4$  and  $y = 2$ ?
- 6 If  $x = 2$  and  $y = -3$ , what is the value of  $2x^2 - 3xy - 2y^2$ ?
- 7 What is the value of the expression  $(a^3 + b^0)^2$  when  $a = -2$  and  $b = 4$ ?
- 8 If  $x = 4$  and  $y = -2$ , the value of  $\frac{1}{2}xy^2$  is
- 9 What is the value of  $\frac{x^2 - 4y}{2}$ , if  $x = 4$  and  $y = -3$ ?
- 10 The expression  $-|-7|$  is equivalent to
- 11 The value of the expression  $|-20| - |6|$  is
- 12 What is the value of the expression  $|-5x + 12|$  when  $x = 5$ ?
- 13 The value of the expression  $-|a - b|$  when  $a = 7$  and  $b = -3$  is
- 14 If  $r = 2$  and  $s = -7$ , what is the value of  $|r| - |s|$ ?
- 15 If  $x = -3$ , what is the value of  $|x - 4| - x^2$ ?
- 16 What is the value of the expression  $3a^2 - 4|a| + 6$  when  $a = -3$ ?
- 17 The value of  $5!$  is
- 18 An expression equivalent to  $3!$  is
  - 1)  $3 \cdot 3$
  - 2)  $3 \cdot 2 \cdot 1$
  - 3)  $3 \cdot 3 \cdot 3$
  - 4)  $-3$
- 19 The value of  $\frac{7!}{3!}$  is
- 20 What is the value of  $\frac{8!}{4!}$ ?
- 21 The value of the expression  $6! + \frac{5!(3!)}{4!} - 10$  is
- 22 What is the value of  $\left| \frac{4(-6) + 18}{4!} \right|$ ?
- 23 When  $x = 4$ , the value of  $2x^0 + x!$  is
- 24 If the expression  $3 - 4^2 + \frac{6}{2}$  is evaluated, what would be done *last*?
- 25 What is the first step in simplifying the expression  $(2 - 3 \times 4 + 5)^2$ ?
- 26 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.

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## **Answer Section**

1 ANS:

18

$$3(-3)^2 + 5(-3) + 6 = 3(9) - 15 + 6 = 27 - 15 + 6 = 12 + 6 = 18$$

REF: 010015a

2 ANS:

-48

$$2x^3y = 2(-2)^3(3) = -48$$

REF: 060807a

3 ANS:

-4

$$(3)(-1) - (-1)^2 = -3 - 1 = -4$$

REF: 060726a

4 ANS:

-31

$$-4 - 3(3)^2 = -4 - 3(9) = -4 - 27 = -31$$

REF: 080408a

5 ANS:

-112

$$-3(-4)^2(2) + 4(-4) = -96 - 16 = -112$$

REF: 081113ia

6 ANS:

8

$$2(2)^2 - 3(2)(-3) - 2(-3)^2 = 8 + 18 - 18 = 8$$

REF: 010915a

7 ANS:

49

REF: 011110ia

8 ANS:

8

$$\frac{1}{2}(4)(-2)^2 = 2(4) = 8$$

REF: 080617a

9 ANS:

14

$$\frac{4^2 - 4(-3)}{2} = \frac{16 + 12}{2} = \frac{28}{2} = 14$$

REF: 010406a

10 ANS:

-7

$$-|-7| = -(+7) = -7$$

REF: 010518a

11 ANS:

14

REF: 081402ia

12 ANS:

13

$$|-5(5) + 12| = |-13| = 13$$

REF: 080923ia

13 ANS:

-10

$$-|a - b| = -|7 - (-3)| = -|-10| = -10$$

REF: 011010ia

14 ANS:

-5

$$|2| - |-7| = 2 - 7 = -5$$

REF: 060522a

15 ANS:

-2

$$|-3 - 4| - (-3)^2 = 7 - 9 = -2$$

REF: 011321ia

16 ANS:

21

$$3(-3)^2 - 4|-3| + 6 = 27 - 12 + 6 = 21$$

REF: 061412ia

17 ANS:

120

$$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$$

REF: 080107a

18 ANS: 2

REF: 060814a

19 ANS:

840

$$\frac{7!}{3!} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{3 \times 2 \times 1} = 840$$

REF: 080503a

20 ANS:

1,680

$$\frac{8!}{4!} = \frac{8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{4 \times 3 \times 2 \times 1} = 1,680$$

REF: 060605a

21 ANS:

740

$$6! + \frac{5!(3!)}{4!} - 10 = 720 + 5(6) - 10 = 740$$

REF: 061309ia

22 ANS:

$$\frac{1}{4}$$

$$\left| \frac{4(-6) + 18}{4!} \right| = \left| \frac{-6}{24} \right| = \frac{1}{4}$$

REF: 081220ia

23 ANS:

26

$$2(4)^0 + (4)! = 2 + 24 = 26$$

REF: 011421ia

24 ANS:

adding

Using the acronym PEMDASLR indicates that addition and subtraction operations should be performed from left to right. Since the addition is to the right of the subtraction, the addition would be done last.

REF: 060314a

25 ANS:

multiply 3 by 4

Using the acronym PEMDASLR indicates that operations inside the expression's parentheses should be performed first. Multiplication precedes addition.

REF: 080612a

26 ANS:

$$\text{No, the answer is 23. } 2(3)^2 + 5 = 2(9) + 5 = 18 + 5 = 23$$

REF: 060432a