

8 Algebra CC – SSA Answer Key

Part I. Multiple Choice. Place the answers to the questions in the boxes below.

1.	2.	3.	4.	5.	6.	7.
1	3	3	2	4	3	3

1. If $A = -3x^2 + 5x - 1$ and $B = -6x^2 + 10$, then $A - B$ equals

(1) $3x^2 + 5x - 11$

(2) $-9x^2 + 5x + 9$

(3) $3x^2 + 5x + 9$

(4) $-3x^2 - 5x + 11$

$$\begin{aligned} &(-3x^2 + 5x - 1) - (-6x^2 + 10) \quad \text{Distribute the } - \text{ sign} \\ &\color{green}{-3x^2 + 5x - 1} + \color{green}{6x^2 - 10} \\ &\color{green}{3x^2 + 5x - 11} \end{aligned}$$

2. Which of the following numbers is a rational number but **not** an integer?

(1) $\sqrt{12}$

Irrational

(2) -6

Integer

(3) $-\frac{3}{7}$

Rational

(4) $\frac{15}{3} = 5$

Integer

3. If $y = -\frac{1}{4}$ and $z = 8$, what is the value of $\frac{1}{2}yz^2$

(1) 8

(2) 2

(3) -8

(4) 4

$$\begin{aligned} &\left(\frac{1}{2}\right)\left(-\frac{1}{4}\right)(8)^2 \\ &-\frac{1}{8} \times 64 \\ &-8 \end{aligned}$$

4. The statement $3 - 3 = 0$ is an example of which property of real numbers?

(1) associative

(2) additive inverse

$$3 + (-3) = 0$$

(3) additive identity

(4) distributive

5. Which expression is equivalent to $(-3x^2)^4$?

(1) $-3x^6$

(2) $-3x^8$

(3) $-81x^8$

(4) $81x^8$

$$\begin{aligned} &(-3x^2)(-3x^2)(-3x^2)(-3x^2) \\ &(-3)(-3)(-3)(-3)(x^2)(x^2)(x^2)(x^2) \\ &\color{green}{81x^8} \end{aligned}$$

6. Given: $A = \sqrt{2}$ $B = 3\sqrt{3}$ $C = \sqrt{8}$
Which expression results in a rational number?

(1) $A + B$

(2) AB

(3) AC

(4) $B + C$

$$\begin{aligned} &AC \\ &\sqrt{2} \cdot \sqrt{8} \\ &\sqrt{2 \cdot 8} \\ &\sqrt{16} = 4 \end{aligned}$$

7. Which expression represents the amount of money Joey earns if he mows x lawns for \$35 each but has to spend \$10 on gas for his lawnmower?

(1) $35 + 10x$

(2) $35 - 10x$

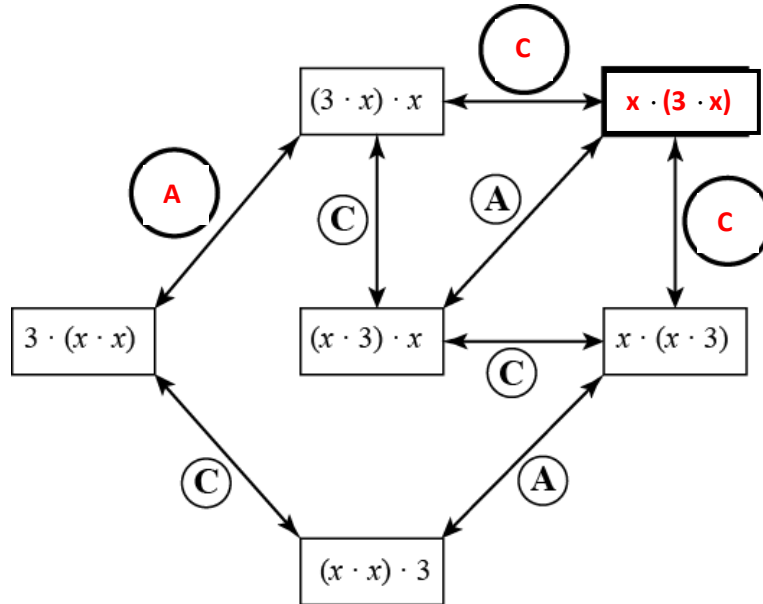
(3) $35x - 10$

(4) $35x + 10$

$$\begin{aligned} &\text{Profit} = \text{Revenue} - \text{Expenses} \\ &\color{green}{(\$ \text{ earned} = \text{Income} - \text{Cost})} \\ &\color{green}{35x - 10} \end{aligned}$$

Part II. Extended Response. Show all necessary work.

8. The diagram below, when completed, shows all possible ways to build equivalent expressions of $3x^2$ using multiplication. The equivalent expressions are connected by labeled segments stating which property of operations, **A** for **Associative Property** and **C** for **Commutative Property**, justifies why the two expressions are equivalent. Fill in the empty circles with **A** or **C** and the empty rectangle with the missing expression to complete the diagram.



9. Express each number below in simplest radical form.

a) $\sqrt{45}$

b) $\sqrt{80}$

$\sqrt{9} \cdot \sqrt{5}$

$\sqrt{16} \cdot \sqrt{5}$

$3\sqrt{5}$

$4\sqrt{5}$

10. A publishing company orders black and blue ink in bulk for its two-color printing press. To keep things simple with its ink supplier, each time it places an order for blue ink, it buys B gallons, and each time it places an order for black ink, it buys K gallons. Over a one-month period, the company places m orders of blue ink and n orders of black ink.

Explain what each expression represents below in the context of the problem.

$m + n$

The total number of orders of blue and black ink

$mB + nK$

The total number of gallons of blue and black ink

Helpful Hint: Think about the situation using friendly numbers.

m : 2 orders of blue ink

n : 3 orders of black ink

B : 4 gallons per order of blue ink

K : 5 gallons per order of black ink

$m + n$

$2 + 3 =$ a total of 5 orders

$mB + nK$

$2(4) + 3(5)$

$8 + 15 =$ a total of 23 gallons of ink