

If you must leave the room while you are taking a test, I cannot allow you to complete the test.

If you are sick enough that you may need to leave the room during a test, you may prefer to have the final exam score count for the test instead.

Use the restroom before you start.

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Term

$$-4.7x^2y^5z$$

$$-4.7x^2y^5z$$

Numerical coefficient

A constant.
It can be one.
If it is one, it may be invisible.

Variable part

Variables, to powers,
multiplied together.
A power may be one.
If it is one, it may be invisible.

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- 1 Identify the numerical coefficient of this term: $-13x$



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- 2 Identify the numerical coefficient of this term: $10y$



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- 3 Identify the numerical coefficient of this term: x

0?

$0x$ is just 0 .

$1x$ is x

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- 4 Identify the numerical coefficient of this term: $-10x^2$

If $x = 3$

$-10 \cdot 3^2$

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- 5 Identify the numerical coefficient of this term: $-\frac{3}{7}z$



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- 6 Identify the numerical coefficient of this term: $-\frac{7y}{11}$



Can we write it as

$$\left(-\frac{7}{11}\right)y ?$$



$$-\frac{7}{11} \cdot y = -\frac{7}{11} \cdot \frac{y}{1} = -\frac{7y}{11}$$

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"Similar" ("Like") Terms

$$-4.7x^2y^5z \text{ is similar to } 7x^2y^5z$$

The variable parts must have exactly the same variables.
The same variable must be raised to the same power.

$$5x^2y \text{ is NOT similar to } 5xy^2$$

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7 Are these two terms similar or not?

$$10z, -7z$$

- A Similar
- B Not similar
- C Impossible to tell



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8 Are these two terms similar or not?

$$-4xy, 6x^2y$$

- A Similar
- B Not similar
- C Impossible to tell



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9 Are these two terms similar or not?

$$-13z^2, 9z$$

- A Similar
- B Not similar
- C Impossible to tell



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10 Are these two terms similar or not?

$$23xy^2z, -13xy^2$$

- A Similar
- B Not similar
- C Impossible to tell



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11 Are these two terms similar or not?

$$a^2b, 21ba^2$$

- A Similar
- B Not similar
- C Impossible to tell



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You can combine similar terms.

$$\begin{aligned} & 2x + 5x \\ & = 7x \end{aligned}$$

Slo-mo instant replay:

$$\begin{aligned} & 2x + 5x \\ & = (2x + 5x) \\ & = (2 + 5)x \\ & = 7x \end{aligned}$$

$$\begin{aligned} & 3n - n \\ & = 2n \end{aligned}$$

Slo-mo instant replay:

$$\begin{aligned} & 3n - n \\ & = 3n - 1n \\ & = (3n - 1n) \\ & = (3 - 1)n \\ & = 2n \end{aligned}$$

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You cannot combine dissimilar terms.

$$\begin{aligned} & 2 + 5x \\ & = 7x ?? \quad \text{But why not?} \end{aligned}$$

Analysis:

$$\begin{aligned} & 2 + 5x \quad \text{Order of ops: multiply before add.} \\ & = 2 + (5x) \quad \text{Same order made obvious.} \\ & = (2 + 5)x \quad \text{What?? Looks like associative, but used} \\ & \quad \quad \quad \text{on mixed multiplying and adding.} \\ & \quad \quad \quad \text{You just made that up!} \\ & = 7x ?? \quad \text{Mixed-up order of operations.} \end{aligned}$$

$$\begin{aligned} & 3n - n \\ & = 3 ?? \quad \text{But why not?} \end{aligned}$$

Analysis:

$$\begin{aligned} & 3n - n \quad \text{Order: multiply before add.} \\ & = (3n) - n \quad \text{Same order made obvious.} \\ & = 3 + (n - n) \\ & \quad \quad \quad \text{What?? Looks like associative, but used on} \\ & \quad \quad \quad \text{mixed multiplying and subtracting. And} \\ & \quad \quad \quad \text{where did that plus come from, anyway??} \\ & \quad \quad \quad \text{You just made that up!} \\ & = 3 + 0 \\ & = 3 \quad \quad \quad \text{Mixed-up order of operations.} \end{aligned}$$

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But perhaps more convincing...

x	$7x - 4x$	$3x$
0	0	0
1	3	3
2	6	6
3	9	9
4	12	12
5	15	15
6	18	18
7	21	21

$7x - 4x = 3x$?
Yes, always!

x	$7 - 4x$	$3x$
0	7	0
1	3	3
2	-1	6
3	-5	9
4	-9	12
5	-13	15
6	-17	18
7	-21	21

$7 - 4x = 3x$?
Hardly ever!

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12 Simplify. Distribute to remove parentheses, then combine similar terms.

$$-9(5y - 6) = -9(5y + -6)$$

A) $-45y - 6$

B) $-45y + 54$

C) $-45y - 54$

D) $-4y + 3$

$$-45y + 54$$



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13 Simplify. Distribute to remove parentheses, then combine similar terms.

$$4(4x + 4 + y)$$

- A) $16x + 4 + 4y$
- B) $16x + 16 + y$
- C) $16x + 4 + y$
- D) $16x + 16 + 4y$



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14 Simplify. Distribute to remove parentheses, then combine similar terms.

$$-(-6m + 5n - 2)$$

- A) $6m - 5n + 2$
- B) $-6m + 5n - 2$
- C) $6m - 5n - 2$
- D) $-6m + 5n + 2$



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15 Simplify. Distribute to remove parentheses, then combine similar terms.

$$(10z + 4) - (4z - 3)$$

- A) $6z - 7$
- B) $14z + 7$
- C) $6z + 7$
- D) $6z + 1$

$$\begin{aligned} &= 10z + 4 + -(4z - 3) \\ &= 10z + 4 + -4z + 3 \\ &= 6z + 7 \end{aligned}$$

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16 Simplify. Distribute to remove parentheses, then combine similar terms.

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

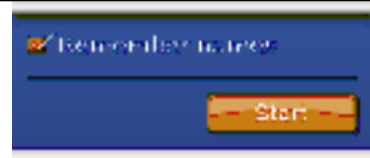
- A) $7x + 10$
- B) $10x - 3$
- C) $7x - 10$
- D) $6x - 10$

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17 Simplify. Distribute to remove parentheses, then combine similar terms.

$$-5(2x - 8) - 4x + 9$$

- A) $-14x + 49$
- B) $-14x - 31$
- C) $14x + 49$
- D) $6x + 49$



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18 Simplify. Distribute to remove parentheses, then combine similar terms.

$$6(x - 3) + 8x - 7$$

- A) $2x - 25$
- B) $14x - 11$
- C) $14x - 25$
- D) $14x + 11$

A

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19 Simplify. Distribute to remove parentheses, then combine similar terms.

A

$$8m + 9n - 8m + 10(m - 4n)$$

- A) $26m + 49n$
- B) $10m - 31n$
- C) $10m + 5n$
- D) $-10m + 49n$

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20 Simplify. Distribute to remove parentheses, then combine similar terms.

A

$$-\frac{3}{8}(z - 16) - \frac{1}{16}z$$

- A) $\frac{7}{16}z - 6$
- B) $-\frac{7}{16}z + 6$
- C) $\frac{7}{16}z + 6$
- D) $\frac{5}{16}z + 16$

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