



Math
Released Item 2016

Grade 7

Errors by Two Students
M25735

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

Rubric	
Score	Description
3	<p>Student response includes each of the following 3 elements.</p> <ul style="list-style-type: none"> • Reasoning component = 1 point <ul style="list-style-type: none"> ○ The student provides a correct description of the error made by Student P in step 1. • Reasoning component = 1 point <ul style="list-style-type: none"> ○ The student provides a correct description of the error made by Student Q in step 3. • Reasoning component = 1 point <ul style="list-style-type: none"> ○ The student provides a correct set of steps shown to determine the value of the expression, -40.92. <p>Sample Student Response:</p> <p>Student P made one error, which occurred in step 1. From the original expression to step 1, each term in the first set of parentheses is multiplied by -2.5. The error in step 1 is that $-2.5 \times 3.1 = -7.75$ not 7.75. There are no additional errors in Student P's steps.</p> <p>Student Q made one error, which occurred in step 3. Since all terms in step 2 are negative or are being subtracted, -1 can be factored from each term. This would leave only positive terms inside the parentheses. That is, the student should have indicated that $-3.5 - 7.75 - 29.67 = -(3.5 + 7.75 + 29.67)$. There are no additional errors in Student Q's steps.</p> <p>A correct set of steps to determine the value of the expression is shown. $-2.5(1.4 + 3.1) + 6.9(-4.3)$ $-3.5 + -7.75 + -29.67$ $-3.5 - 7.75 - 29.67 = -40.92$ or $-2.5(1.4 + 3.1) + 6.9(-4.3)$ $-2.5(4.5) + -29.67$ $-11.25 + -29.67 = -40.92$</p> <p>or other valid response</p>
2	Student response includes 2 of the above elements.
1	Student response includes 1 of the above elements.
0	Student response is incorrect or irrelevant.

Anchor Set

A1 – A8

With Annotations

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

Student P:

Student P made their error in the first step of the problem and that was to make 7.75 a positive instead of a negative.

Student Q:

Student Q made their error in the 3rd step and that is because they put 3.5's negative sign outside of the parentheses instead of inside.

Step 1:

$$-3.5 - 7.75 + 6.9(-4.3)$$

$$\text{Step 2: } -3.5 - 7.75 - 29.67$$

$$\text{Step 3: } -11.25 - 29.67$$

$$\text{Step 4: } -40.92$$

So, -40.92 is your final answer.

Annotation

Anchor Paper 1

Score Point 3

The response earns full credit. The response includes each of the three required elements:

- A correct description of the error made by Student P in step 1 is given (made their error in the first step of the problem and that was to make 7.75 a positive instead of a negative).
- A correct description of the error made by Student Q in step 3 is given (made their error in the 3rd step and that is because they put 3.5's negative sign outside of the parentheses instead of inside).
- A correct set of steps to determine the value of the expression is shown ($-3.5 - 7.75 - 29.67$, $-11.25 - 29.67$, -40.92).

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

the first mistake student p made was that he forgot to push the negative through and change the positive to a negative in step 2. then that step he messed up caused it to snowball and get the problem wrong. but student q messed up when he put parenthesis around the numbers when he wasn't suppose to in step 3. so that step caused him to snowball. here's how the actual problem was supposed to be worked...

$$\begin{aligned}
 &-3.5 - 7.75 + 6.9(-4.3) \\
 &-3.5 - 7.75 - 29.67 \\
 &-11.25 - 29.67 \\
 &-40.92
 \end{aligned}$$

Annotation

Anchor Paper 2

Score Point 3

The response earns full credit. The response includes each of the three required elements:

- A correct description of the error made by Student P is given. (he forgot to push the negative through and change the positive to a negative in step 2). Identifying step 2 makes the wording acceptable as 7.75 is the only positive value that is affected.
- A correct description of the error made by Student Q in step 3 is given (he put parenthesis around the numbers when he wasn't supposed to in step 3).
- A correct set of steps to determine the value of the expression is shown $(-3.5 - 7.75 - 29.67, -11.25 - 29.67, -40.92)$.

Scoring Note: A response does not need to indicate which specific steps the errors are located in to earn full credit when the explanations are clear and concise. However, identifying the step an error is in can allow for explanations to earn credit when they, otherwise, would be too vague to earn credit on their own.

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

1. student P: he didnt put 7.75 as a negative. he also got his answer wrong.

1. student Q: on step 1 he put an subtraction sign between 3.5 and 7.75 there was supposed to be a addtion sign. on step 3 he was not supposed to add 7.75 and 29.67 and subtract 3.5. then on step 4 he added wrong. last he got the wrong answer.

3. step 1:

$$-3.5 + (-7.75) + (-29.67)$$

$$\text{step 2: } -11.25 + (-29.67)$$

$$\text{step 3: } -40.92$$

Annotation

Anchor Paper 3

Score Point 2

The response earns partial credit. The response includes two of the three required elements:

- A correct description of the error made by Student P in step 1 is given (he didnt put 7.75 as a negative).
- A correct set of steps to determine the value of the expression is shown ($-3.5 + (-7.75) + (-29.67)$, $-11.25 + (-29.67)$, -40.92).

Although a correct description of the error made by student Q is given (on step 3 he was not supposed to add 7.75 and 29.67 and subtract 3.5), an incorrect description of an error made is also provided (on step 1 he put an subtraction sign between 3.5 and 7.75 there was supposed to be a addtion sign). Incorrect additional descriptions are not ignored and thus the element does not earn credit.

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

An error that is in student P work is that when she or he did negative 2.5×3.1 they got 7.75 but the correct answer was negative 7.75. An error that is in student Q work is that in step one they got the wrong sign they got *minus* sign but the correct sign is addition.

Step one: -3.5 plus negative 7.75 plus $6.9 \times (-4.3)$

Step two: -3.5 plus -7.75 plus -29.67

Step three: -11.25 plus -29.67

Step four: -40.92

Annotation

Anchor Paper 4

Score Point 2

The response earns partial credit. The response includes two of the three required elements:

- A correct description of the error made by Student P in step 1 is given. (when she or he did negative 2.5×3.1 they got 7.75 but the correct answer was negative 7.75).
- A correct set of steps to determine the value of the expression is shown (Step one: -3.5 plus negative 7.75 plus $6.9 \times (-4.3)$, Step two: -3.5 plus -7.75 plus -29.67, Step three: -11.25 plus -29.67, Step four: -40.92).

An incorrect description of the error made by Student Q is given (in step one they got the wrong sign they got *minus* sign but the correct sign is addition).

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

Student P's mistake is making the 7.75 a positive when it's really a negative.

Student Q's mistakes is that he put parenthesis when he didn't need to and that he added all the numbers together but what they should have done was $-3.5 - 7.75 = -11.25$ then minus 29.67 which gets you -40.92 .

Annotation

Anchor Paper 5

Score Point 1

The response earns partial credit. The response includes one of the three required elements:

- A correct description of the error made by Student P in step 1 is given. (making the 7.75 a positive when it's really a negative).

An insufficient description of the error made by Student Q in step 3 is given (he put parenthesis when he didn't need to and that he added all the numbers together).

An incorrect set of steps to determine the value of the expression is shown ($-3.5 - 7.75 = 4.26$ then minus 29.67 which gets you -25.42).

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

Student P didn't use the correct signs in step 1. Also, in steps 2 and 3 they also messed the signs.

Student Q shouldn't have done step 3 because it doesn't make sense to do that in this situation.

The correct way to determine the value of the expression is:

Step 1:

$$[(-3.5) + (-7.75)] - (-29.67)$$

$$\text{Step 2: } (-11.25) + (-29.67)$$

$$\text{Step 3: } -40.92$$

Annotation

Anchor Paper 6

Score Point 1

The response earns partial credit. The response includes one of the three required elements:

- A correct set of steps to determine the value of the expression is shown $[(-3.5) + (-7.75)] - (-29.67)$, Step 2: $(-11.25) + (-29.67)$, Step 3: -40.92).

An insufficient description of the error made by Student P is given (didn't use the correct signs in step 1. Also in steps 2 and 3 they also messed up the signs).

An insufficient description of the error made by Student Q is given (shouldn't have done step 3 because it doesn't make sense to do that). Both descriptions indicate the correct step where the errors occur, but are too vague to earn credit.

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

P should have done $1.4 + 3.1$ and have got 4.5 then 4.5×-2.5
 Q should have -2.5×4.5 and got -11.25

Annotation

Anchor Paper 7

Score Point 0

The response earns no credit. The response includes none of the three required elements.

An insufficient description of the error made by Student P is given (P should have done $1.4 + 3.1$ and have got 4.5 then 4.5×-2.5).

An incorrect description of the error made by Student Q is given (Q should have -2.5×4.5 and got -11.25).

No steps or work to determine the value of the expression is shown.

Scoring Note: Although insufficient to earn credit, the description given for Student P is not incorrect and does not detract from the response. The response simply indicates that the work in the parenthesis should be completed before the distribution of -2.5, but does not clarify the error in process made by the student.

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

in the fist student mest up on sign
rules student p

student q mest up in step 5 because
of step 4

Annotation
Anchor Paper 8
Score Point 0
<p>The response earns no credit. The response includes none of the three required elements.</p> <p>An insufficient description of the error made by Student P is given (in the first student mess up on sign rules).</p> <p>An incorrect description of the error made by Student Q is given (student q mess up in step 5 because of step 4).</p> <p>No steps or work to determine the value of the expression is shown.</p>

Practice Set

P101 - P105

No Annotations Included

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

The first incorrect error that student P made was they got 7.75. When you do a negative times a positive you should always get a negative. Then they said $7.75 - 29.67$ when they should have added negative 29.67. Student Q messed up because they tried to say that in step three you should subtract them all. Then they got negative one times negative 33.92 which gave them a positive. Here's how I did it.

$-3.5 + -7.75 + -29.67$ once I did all that I got -40.92

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

Student P

At first 7.75 should be negative. Therefore altering their final answer of -25.42

Student Q They are correct until the place where they should subtract them all. They put the -3.5 's negative sign on the outside of the whole equation there for giving them the incorrect answer of 33.92
The correct answer would be -40.92 .

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

$$\begin{aligned}
 & -2.5(1.4 + 3.1) + 6.9(-4.3) \\
 & -2.5(4.5) - 29.67 \\
 & -11.25 - 29.67 \\
 & -40.92
 \end{aligned}$$

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

The error they made was that they tried to multiply and add at the same time. They tried to switch the problem up subtracting the same thing they subtracted in the last problem.

The errors that were made in Q were. they did the same thing that they did in problem p but they showed the step then put it at the bottom the right way to subtract it and get the right answer. They also added wrong

$$-(3.5 - 7.75 - 29.67)$$

the answer they should have got for that was -40.92

Two students determined the value of this expression.

$$-2.5(1.4 + 3.1) + 6.9(-4.3)$$

These are the steps each student used.

Student P	Student Q
Step 1: $-3.5 + 7.75 + 6.9(-4.3)$	Step 1: $-3.5 - 7.75 + 6.9(-4.3)$
Step 2: $-3.5 + 7.75 - 29.67$	Step 2: $-3.5 - 7.75 - 29.67$
Step 3: $7.75 - 3.5 - 29.67$	Step 3: $-(3.5 - 7.75 - 29.67)$
Step 4: -25.42	Step 4: $-(-33.92)$
	Step 5: 33.92

- Describe any errors made by Student P.
- Describe any errors made by Student Q.
- Show a complete set of correct steps to determine the value of the expression.

Enter your answers and your work in the space provided.

p

one error for p is that the 7.75 is supposed to be negative.
they also got the wrong answer it is -40.92 not -25.42

q

he messed up in his adding and by putting the negative sign outside of the parenthesis and he got the answer wrong it is -40.92
 $-2.5(1.4 + 3.1) + 6.9(-4.3)$
 $-3.5 - 7.75 - 29.67$
 $-7.75 - 3.5 - 29.67$
 -40.92

Practice Set

Paper	Score
P101	3
P102	2
P103	1
P104	0
P105	3