

Title: Integers

Materials:

Teacher notes and script. (*This page and next.*)
Student note sheet. (*Make a copy for each student.*)
Student worksheet. (*Make a copy for each student.*)
Overheads (*Make transparencies*)

Previous Knowledge Needed: none

Important Concepts/Methods:

To multiply and divide integers – multiply and divide numbers as always. If signs are the same, the answer is positive. If signs are different, the answer is negative.

To add integers – If the signs are the same, add and keep the sign. If signs are different, subtract and take the sign of the larger number.

To subtract integers – change to add the opposite and follow addition rules.

Script:

When working with integers you need to pay attention to the signs. Let's read the first problem. (*Put up the overhead and read.*)

1) $-125 \div 5$

- a) -25
- b) 25
- c) -15
- d) 15

$\begin{array}{r} 25 \\ 5 \overline{)125} \\ \underline{-10} \downarrow \\ 25 \\ \underline{-25} \\ 0 \end{array}$	#'s have different signs, so answer is negative: a) -25.
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When you multiply or divide integers, you just multiply or divide like you normally would. 125 divided by 5 is 25. (*Work out problem and have students do the same.*) Now we need to decide if it's positive or negative. The rule says that if the signs are different the answer's negative, so our answer is negative 25. (*Write answer on the overhead, and have students do the same.*) Any questions? (*Answer any questions that the students have.*)

The next problem is adding. (*Put up the overhead and read.*)

2) $-134 + 375$

- a) -509
- b) 509
- c) -241
- d) 241

$\begin{array}{r} 375 \\ \underline{-134} \\ 241 \end{array}$	The bigger # (375) is positive, so answer is positive: d) 241.
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The signs are different, so the rule says that we subtract the numbers. 375 minus 134 is 241. (*Work out problem on the overhead and have students do it on their own paper.*) Now we need to decide if it is positive or negative. The rule says that it's the sign of the larger number. The larger number, 375, is positive, so our answer is positive. (*Write answer on overhead and have students answer on their papers.*) Any questions? (*Answer any questions that the students have.*)

Now let's try a subtraction problem. (*Put up the overhead and read.*)

3) $-234 - -89$

- a) -145
- b) 145
- c) 323
- d) -323

$$-234 - -89 = -234 + 89$$

$$234$$

$$\underline{-89}$$

$$145$$

The bigger # (234) is negative, so answer is negative: a) -145.

The first step is to rewrite the problem, changing it to "add the opposite". So "minus negative 89" changes to "add positive 89." (*Rewrite problem as $-234 + 89$ on the overhead. Have students do the same.*) Now we follow the rules for addition. The signs are different, so we subtract: 234 minus 89 is 145. (*Work out problem and have students do the same.*) Now we need to decide if the answer is positive or negative. The rule says to take the sign of the larger number. 234 is negative, so our answer is negative. (*Write answer on overhead and have students answer on their papers.*) Any questions? (*Answer any questions that the students have.*)

Common Mistakes:

Let's look at what mistakes were made in the other answer. In the first problem b had the wrong sign and c and d divided wrong.

In the next problem, a and b added the numbers instead of subtracting them, and c has the wrong sign.

In the last problem we did b is the wrong sign, and c and d added the numbers instead of subtracting them.

Student Problems:

Try the next three problems on your own. (*Give students time to try the problems.*) (*Put overhead up and either work out problems or give students the opportunity to come up and explain them. Make sure they do all steps.*)

Assignment: (*Hand out assignment sheet. Either give students time to do and then discuss their problems, or give as homework and collect the next day.*)

1) $-125 \div 5$

a) -25

b) 25

c) -15

d) 15

2) $-134 + 375$

a) -509

b) 509

c) -241

d) 241

3) $-234 - -89$

a) -145

b) 145

c) 323

d) -323

4) $-12(56)$

a) -672

b) 44

c) -68

d) -4.7

5) $-45 + -78$

a) -33

b) 33

c) -123

d) 123

6) $34 - (-78)$

a) -112

b) 112

c) -44

d) 44

Ideas that I'm going to study and learn.

To multiply and divide integers – multiply and divide numbers as always. If signs are the same, the answer is positive. If signs are different, the answer is negative.

To add integers – If the signs are the same, add and keep the sign. If signs are different, subtract and take the sign of the larger number.

To subtract integers – change to add the opposite and follow addition rules.

1) $-125 \div 5$ a) -25 b) 25 c) -15 d) 15	2) $-134 + 375$ a) -509 b) 509 c) -241 d) 241	3) $-234 - -89$ a) -145 b) 145 c) 323 d) -323
4) $-12(56)$ a) -672 b) 44 c) -68 d) -4.7	5) $-45 + -78$ a) -33 b) 33 c) -123 d) 123	6) $34 - (-78)$ a) -112 b) 112 c) -44 d) 44

Worked Out Solutions

1) $-125 \div 5$

- a) -25
- b) 25
- c) -15
- d) 15

$$\begin{array}{r} 25 \\ 5 \overline{)125} \\ \underline{-10} \downarrow \\ 25 \\ \underline{-25} \\ 0 \end{array}$$

#'s have different signs,
so answer is negative.
a) -25

2) $-134 + 375$

- a) -509
- b) 509
- c) -241
- d) 241

$$\begin{array}{r} 375 \\ \underline{-134} \\ 241 \end{array}$$

The bigger # (375) is
positive, so answer is
positive: d) 241.

3) $-234 - -89$

- a) -145
- b) 145
- c) 323
- d) -323

$$\begin{array}{r} -234 - -89 = -234 + 89 \\ 234 \\ \underline{-89} \\ 145 \end{array}$$

The bigger # (234) is
negative, so answer is
negative: a) -145.

4) $-12(56)$

- a) -672
- b) 44
- c) -68
- d) -4.7

$$\begin{array}{r} 56 \\ \times 12 \\ \hline 112 \\ 56 \times \\ \hline 672 \end{array}$$

#'s have different signs,
so answer is negative.
a) -672.

5) $-45 + -78$

- a) -33
- b) 33
- c) -123
- d) 123

$$\begin{array}{r} 45 \\ \underline{+78} \\ 123 \end{array}$$

Both #'s are negative,
so answer is negative:
c) -123.

6) $34 - (-78)$

- a) -112
- b) 112
- c) -44
- d) 44

$$\begin{array}{r} 34 - (-78) = 34 + 78 \\ 78 \\ \underline{+78} \\ 112 \end{array}$$

Both #'s are now positive,
so answer is positive:
b) 112.

Let me show what I know!

Solve each of the following problems then find the answers in the square below. The answers are written out. Example: $4 =$ positive four, $-3 =$ negative three

Some of the left over letters will spell out a phrase. When you're done with the puzzle, put the letters that haven't been circled in the blanks to reveal a hidden message. You won't use all the extra letters.

P N K P E N E E P S T E U D Y O E I N E
 O E N O N E G A T I V E T E N W E G E P
 S G Y S O T E G E T H R E P X T R R G O
 I A T I E E N L P N I H F O I Y H Y A S
 T T F T V V O O U E N T E S S T T E T I
 I I I I I E D I G T Y A I Y R Y N I T
 V V F V T T V N D A Y T O T T I T E V I
 E E E E I I I U L T L N N I X H N G E V
 T S V F S S T P A I S E S V I T E A N E
 W I I O O O A T H V V W E E S E V T I E
 E X T U P P G P R E O T F S E V E I N I
 L T A R I C E I S F E E N E V I S V E G
 V E G C Z Y N E E I X V A V I T E E M H
 E E E A K E V P E F R I O E T I V T A T
 R N N E J I R V U T Q T W N I S I H D Y
 W Q L P T W T O W Y H I G T S O T I F O
 T F Z A U A T S C S D S N E O P I R G N
 A U G N P J V I Q I X O H E P V S T Q E
 N E X Z Q Q Q U F X Y P S N V Q O Y K P
 N E G A T I V E T W E L V E R X P K M U

$-6.6 + 6.6$

$9 + (-8)$

$4(8)$

$5(-6)$

$146/2$

$230/10$

$5 - (-5)$

$-120/10$

$100 \div (-100)$

$81 - 90$

$-41 + (-32)$

$-89 + 39$

$-90 - (-80)$

$-85 \div (-5)$

$-7(8)$

$-7 - 9$

$78 - 74$

$-9(-9)$

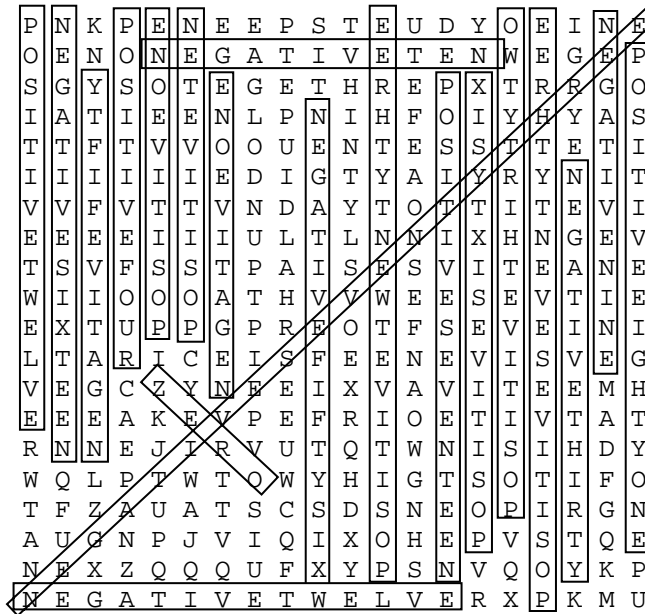
$-6(-11)$

$-65 + 77$

Let me show what I know!

Solve each of the following problems then find the answers in the square below. The answers are written out. Example: $4 =$ positive four, $-3 =$ negative three

Some of the left over letters will spell out a phrase. When you're done with the puzzle, put the letters that haven't been circled in the blanks to reveal a hidden message. You won't use all the extra letters.



$$-6.6 + 6.6 = 0$$

$$9 + (-8) = 1$$

$$4(8) = 32$$

$$5(-6) = -30$$

$$146/2 = 73$$

$$230/10 = 23$$

$$5 - (-5) = 10$$

$$-120/10 = -12$$

$$100 \div (-100) = -1$$

$$81 - 90 = -9$$

$$-41 + (-32) = -73$$

$$-89 + 39 = -50$$

$$-90 - (-80) = -10$$

$$-85 \div (-5) = 17$$

$$-7(8) = -56$$

$$-7 - 9 = -16$$

$$78 - 74 = 4$$

$$-9(-9) = 81$$

$$-6(-11) = 66$$

$$-65 + 77 = 12$$

K E E P S T U D Y I N G ! G E T H E L P I F

Y O U N E E D I T A N D Y O U ' L L P A S S

T H E P R O F I C I E N C Y E X A M !