

Integers Review

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Solutions

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Key Words

Match each term with an example.

Term

Example

1. zero principle

A answer to $(-5) \times (-4)$

2. opposite integers

B $15 + (-15) = 0$

C -2 and 4

3. positive integer

D -20 and 20

4. negative integer

E answer to $(-15) \div 3$

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5. Simplify.

a) $5 + 7$

$= 12$

c) $-5 + (-12)$

$= -17$

e) $-17 + 9$

$= -8$

b) $-13 + 13$

$= 0$

d) $8 + (-15)$

$= -7$

f) $-3 + (-6) + (-9) + 5$

$= -13$

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6. Find each sum.

a) $20 + 7 = 27$
c) $-11 + 5 = -6$
e) $12 + 6 + (-4) = 14$

b) $6 + (-6) = 0$
d) $-2 + (-8) = -10$
f) $5 + 13 + (-5) + (-10) + 3 = 6$

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7. The table shows the change in the population of Smallville at each census since 1971.

Year	Change
1971	-20 000
1976	-82 000
1981	+24 000
1986	-12 000
1991	+17 000
1996	+21 000
2001	-33 000

What was the overall change in population?

Add up all the values in the "change" column.
 $= -85,000$

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8. Evaluate each expression. Do not use a calculator.

$$\text{a) } 10 - 15 = -5$$

$$\text{c) } -14 - (-22) = 8$$

$$\text{b) } -5 - 7 = -12$$

$$\text{d) } -53 - 42 - (-25) = -70$$

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9. Find each difference.

$$\text{a) } 10 - 5 = 5$$

$$\text{c) } -5 - (-5) = 0$$

$$\text{b) } -16 - 14 = -30$$

$$\text{d) } 11 - (-9) = 20$$

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10. The table shows each city's time zone relative to GMT, or Greenwich Mean Time.

City	Time Zone
Calgary	GMT - 7
Helsinki	GMT + 2
Tokyo	GMT + 9
Honolulu	GMT - 10



a) How many hours behind Helsinki is Honolulu?

$$\begin{aligned}
 & \text{Honolulu} - \text{Helsinki} \\
 & = (-10) - (2) \\
 & = -12 \\
 & \Rightarrow 12 \text{ hours} \\
 & \quad \text{behind}
 \end{aligned}$$

b) How many hours ahead of Calgary is Tokyo?

$$\begin{aligned}
 & \text{Tokyo} - \text{Calgary} \\
 & = 9 - (-7) \\
 & = 16 \\
 & \Rightarrow 16 \text{ hours ahead}
 \end{aligned}$$

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11. For each expression, use a pattern to illustrate the rule for multiplying integers.

$$\begin{aligned}
 \text{a) } 3 \times (-4) & = -12 \\
 \text{b) } -2 \times 5 & = -10 \\
 \text{c) } -4 \times (-2) & = 8
 \end{aligned}$$

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12. Multiply. Do not use a calculator.

a) $7 \times (-2) = -14$
b) $-3 \times (-6) = 18$
c) $-10 \times 7 = -70$

d) $15 \times (-4) = -60$
e) $-2 \times (-3) \times (-5) \times 10 = -300$

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13. Explain how you can tell the sign of a product of more than two integers.

Count the # of negatives.
If the total of negatives is ODD, then the product is negative.
If it's EVEN, then the product is positive.

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14. The average change in the tiger population over the past 100 years is -940 tigers per year.



- a) What was the total change in the tiger population?
b) What was the change in the tiger population between 1950 and 2000?

$$\begin{aligned} \text{a)} & -940 \times 100 \\ & = -94,000 \\ \text{b)} & 2000 - 1950 = 50 \\ & \Rightarrow -940 \times 50 \\ & = -47,000 \end{aligned}$$

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15. Divide. Do not use a calculator.

$$\text{a)} 35 \div (-5) = -7$$

$$\text{b)} -64 \div (-4) = 16$$

$$\text{c)} -72 \div 9 = -8$$

$$\text{d)} -56 \div (-8) = 7$$

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16. Find all the integers, other than 1 and -1, that divide evenly into -10.

2 and -5
5 and -2
10 and -10

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17. Write an expression involving integer division for each situation. Evaluate each expression and state its meaning.
- a) While scuba diving, Diane dived 50 m in 10 stages. What was the mean depth of her dive per stage?
- b) A parachutist descended a total of 60 m in 5 s. What was the unit rate of descent?
- c) The temperature dropped 24°C over 8 h. What was the mean hourly temperature drop?

$$\begin{aligned} -50 \div 10 &= -5 \\ &5 \text{ m per stage} \\ -60 \div 5 &= -12 \\ &12 \text{ m/s} \\ -24 \div 8 &= -3 \\ &3^\circ\text{C per hour} \end{aligned}$$

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18. Evaluate.

a) $2 + 5(7 - 10)$

c) $4^2 - 5^2$

b) $-3(6^2 - 30)$

d) $-6 + 12 \div (-2) - 9$

$$\begin{aligned} \text{a) } 2 + 5(-3) & \\ &= 2 + (-15) \\ &= -13 \end{aligned}$$

$$\begin{aligned} \text{c) } 16 - 25 & \\ &= -9 \end{aligned}$$

$$\begin{aligned} \text{b) } -3(36 - 30) & \\ &= -3(6) \\ &= -18 \end{aligned}$$

$$\begin{aligned} \text{d) } -6 + (-6) - 9 & \\ &= -12 - 9 \\ &= -21 \end{aligned}$$

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19. The temperature at the top of a 5900-m mountain is -44°C . At the bottom, the temperature is 15°C . What is the mean temperature difference per 100 m?

$$\begin{aligned} \text{Temp difference} &= (-44) - 15 \\ &= -59^\circ\text{C} \end{aligned}$$

$$\begin{aligned} \# \text{ of } 100\text{m "stages"} &= \frac{5900}{100} \\ &= 59 \end{aligned}$$

$$\text{mean change} = \frac{-59}{59} = -1$$

$$\Rightarrow -1^\circ\text{C per } 100\text{m}$$

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20. Determine the next four numbers in each pattern. Justify your answers.

a) -3, -6, -9, -12

c) -15, -4, 7, 18

b) 5, 2, -1, -4

d) -7, -14, -28, -56

a) -15, -18, -21 (subtract 3)

b) -7, -10, -13 (subtract 3)

c) 29, 40, 51 (add 11)

d) -63, -70, -77 (subtract 7)

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21. Kathy started a business selling crafts at a flea market. Her initial expenses were \$700 and she expects weekly sales of \$125.

a) Describe the pattern in her income.

b) What income can she expect after 2 weeks?

c) When can Kathy expect to begin to make a profit from her business?

a) Increasing by \$125 per week

b) $2 \times \$125 = \250

c) $4 \times \$125 = \500

$5 \times \$125 = \625

$6 \times \$125 = \750

makes a profit after 6 weeks

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