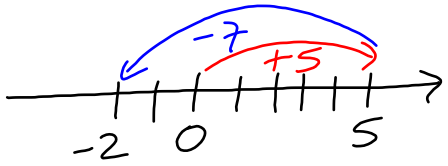
Solutions

Nov 20-18:35

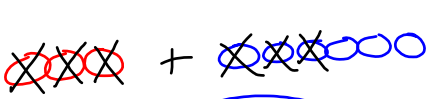
1. Explain how you would subtract 2 – (–7) using integer chips. What do you do when there are not enough chips to subtract?
2. In an investment board game, Sarah earned $5 on her first turn, but then lost $7 on her next turn. Illustrate this situation on a number line.
3. Show 3 – 6 in at least three different ways.

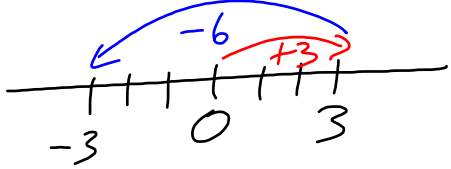
1. There are no negative chips for you to take away so we have to add seven zero pairs. We can then subtract 7 blue chips.

2. 

$= -2$

3. 
$= -3$


$= -3$



$= -3$

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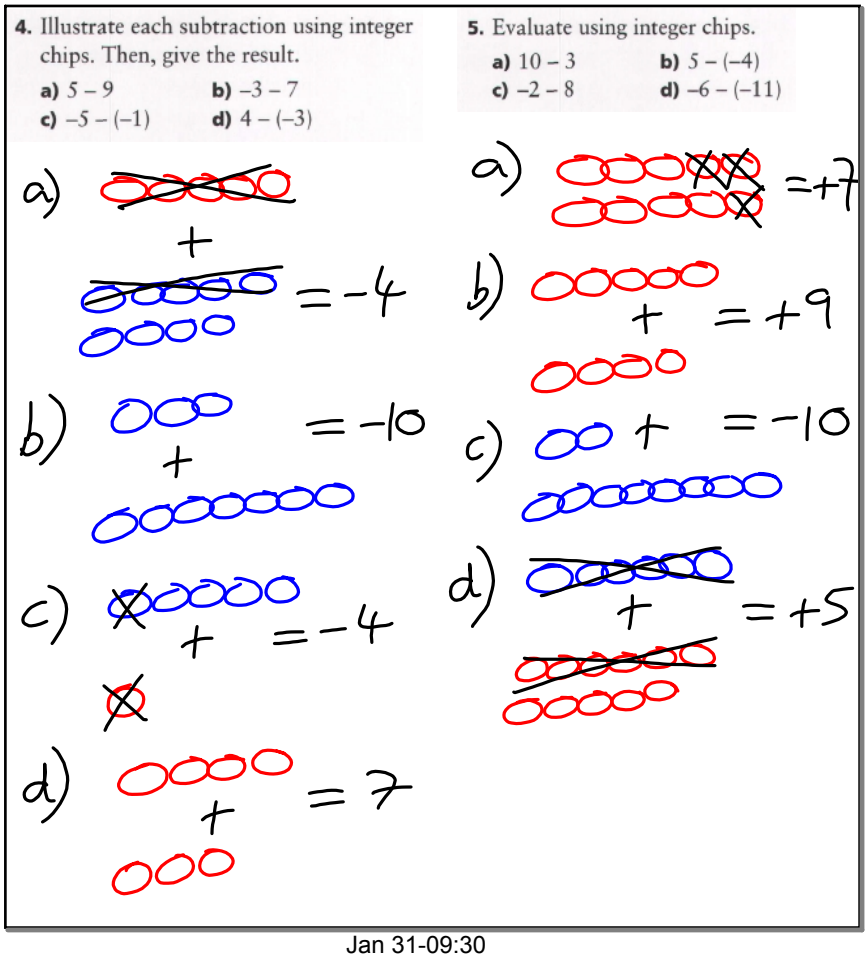
4. Illustrate each subtraction using integer chips. Then, give the result.

a) 5 – 9 **b)** –3 – 7
c) –5 – (–1) **d)** 4 – (–3)

5. Evaluate using integer chips.

a) 10 – 3 **b)** 5 – (–4)
c) –2 – 8 **d)** –6 – (–11)



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6. State whether each difference is positive, negative, or zero. Do not evaluate.

a) –6 – (–6) **b)** 7 – 15
c) 3 – (–25) **d)** –7 – (–4)
e) –10 – (–15) **f)** 103 – 438

a) Zero
b) Negative
c) Positive
d) Negative
e) Positive
f) Negative

7. Subtract by adding the opposite.

a) 1 – 7 **b)** 3 – (–12)
c) –2 – 10 **d)** –5 – 8
e) 8 – (–4) **f)** –10 – (–3)

a) $= 1 + (-7)$
$= -6$
b) $= 3 + (+12)$
$= +15$
c) $= -2 + (-10)$
$= -12$
d) $= -5 + (-8)$
$= -13$
e) $= 8 + (+4)$
$= +12$
f) $= -10 + (+3)$
$= -7$

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8. Find each difference by adding the opposite.

a) $-3-6$ **b)** $-8-(-6)$
c) $15-(-17)$ **d)** $-45-(-32)$
e) $44-71$ **f)** $-30-15$

a) $= -3+(-6)$
$= -9$

b) $-8+(+6)$
$= -2$

c) $=15+(+17)$
$= +32$

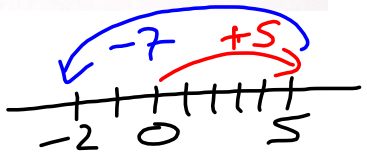
d) $=-45+(+32)$
$=-13$

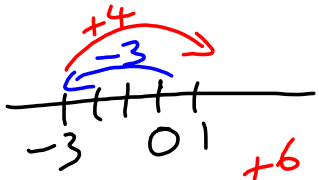
e) $= 44+(-71)$
$= -21$

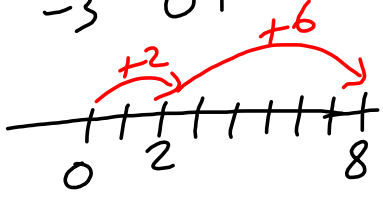
f) $= -30+(-15)$
$= -45$

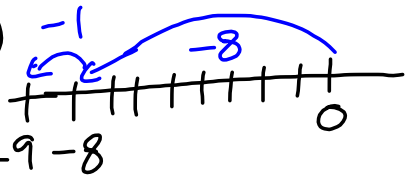
9. Subtract using a number line.

a) $5-7$ **b)** $-3-(-4)$
c) $2-(-6)$ **d)** $-8-1$

a)


b)


c)


d)


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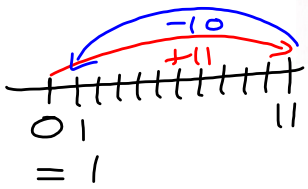
10. Find each difference using a number line.

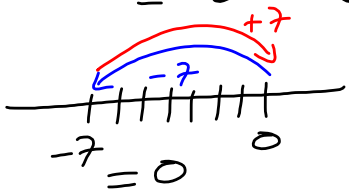
a) $11-10$ **b)** $-5-3$
c) $-7-(-7)$ **d)** $8-(-3)$

a)


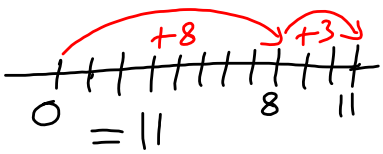
$= 1$

b)


$= -8$

c)


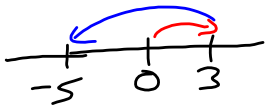
$= 0$

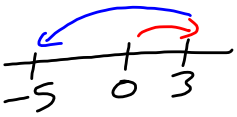
d)


$= 11$

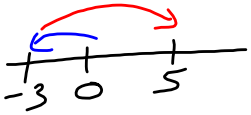
11. Use a number line to evaluate each expression. Which have the same result? Explain.

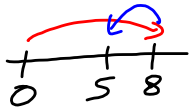
a) $3-8$ **b)** $3+(-8)$
c) $3-(-8)$ **d)** $-3+8$
e) $8-3$ **f)** $-3-8$

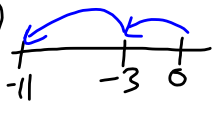
a)


b)


c)


d)


e)


f)


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12. Copy each equation. Replace each ▭ with the correct integer.

a) $6 - ▭ = -10$
b) $-4 - ▭ = -5$
c) $5 - ▭ = 7$
d) $▭ - 12 = -2$
e) $▭ - 3 = -10$
f) $▭ - (-7) = -4$

a) +16
b) +1
c) −2
d) +10
e) −7
f) −11

13. Evaluate each expression.

a) $10 - 15 - 9$
b) $5 - 17 - (-3)$
c) $-4 - (-2) - 7$
d) $-13 - 12 - (-15)$
e) $-40 - (-20) - (-10)$
f) $9 - 6 - 8 - 12$

a) −14
b) −9
c) −9
d) −10
e) −10
f) −17

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14. Express each of the following using integer subtraction. Then, evaluate and interpret the results.

a) Wendy gained 10 points then lost 15 points.
b) While on a training routine, you lost 3 kg one month. Then, you lost another 4 kg.
c) Jose owed $10. His friend paid $5 of that debt for him.
d) The high temperature on Friday was 3°C. The low temperature was −6°C.

a) $+10 - (+15)$
$= -5$ [lost 5 points]

b) $-3 - (+4)$
$= -7$ [lost 7 kg]

c) $-10 - (-5)$
$= -5$ [Joe owes $5]

d) $+3 - (-6)$
$= +9$ [difference of 9°]

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15. Mount Everest is the tallest mountain in the world, measured from sea level.

Mount Mauna Kea, in Hawaii, U.S.A., is the tallest mountain when measured from its base. It rises from 5854 m below sea level to 4349 m above sea level.

How tall is Mount Mauna Kea?

$5854 - (-4349)$

$= 5854 + 4349$

$= 10{,}203\ m$

16. On the Space Shuttle, liquid oxygen is stored at –183°C. The oxygen is heated to a temperature of 260°C, and then it is mixed with hydrogen. Hydrogen is stored at a temperature of –250°C. The mixture that results burns at a temperature of 3315°C.

a) By how much is the liquid oxygen heated before it is mixed with hydrogen?

b) How much hotter is the temperature at which the mixture burns than the temperature at which the hydrogen is stored?

a) $260 - (-183)$

$= 260 + 183$

$= 443°$

b) $3315 - (-250)$

$= 3315 + 250$

$= 3565°$

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Try This!

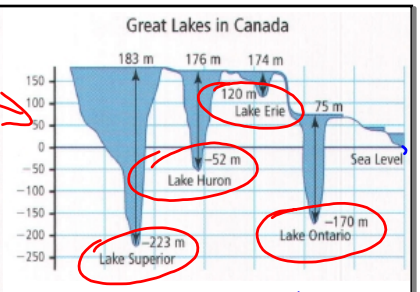
17. The diagram shows the elevations, compared to sea level, of the surface and deepest points of the four Great Lakes in Canada.

a) How deep is each lake?

b) How much farther below sea level is the bottom of Lake Superior than the bottom of Lake Erie?

c) The CN Tower in Toronto is 553 m tall. If it were standing on the bottom of Lake Ontario, would it be submerged or would it be visible above the surface? By how much?

d) The Skylon Tower in Niagara Falls is 160 m tall. How many Skylon Towers could be stacked in Lake Superior and still be submerged?



b) $-120 - (-223)$

$= -120 + 223$

$= 103\ m$

c) Lake Ontario

$= 75 - (-170)$

$= 245\ m$

CN Tower

$= 553 - 245$

$= 308\ m$ above

Skylon Tower

$= 160$

2 Skylon Towers

$= 160 \times 2 = 320$

3 Skylon Towers

$= 160 \times 3 = 480\ m$

Too much

d) Lake Superior

$= 183 - (-223)$

$= 183 + 223$

$= 406\ m$

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