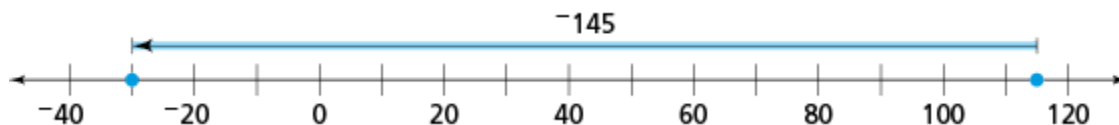


Focus Question: How can you write a number sentence to represent a change on a number line, and how can you use a number line to represent a number sentence?

Problem Answers

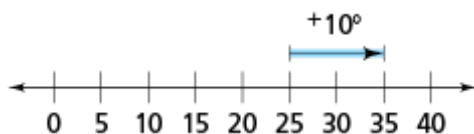
Problem 1.3

A. $145 - ^\circ\text{F}$; $115^\circ + n = 30^\circ$ - or $30^\circ - -115^\circ = n$

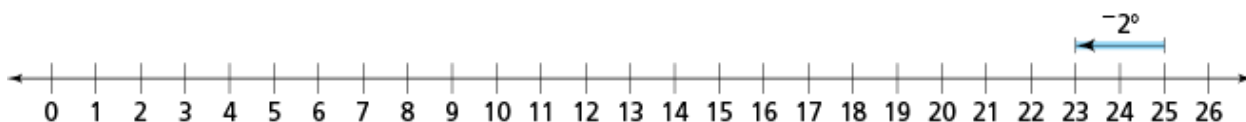


B.

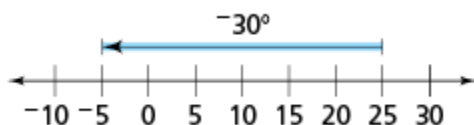
1. 35°F ; $25^\circ + 10^\circ = 35^\circ$



2. 23°F ; $25^\circ + 2^\circ = 23^\circ$ - or $25^\circ - 2^\circ = 23^\circ$

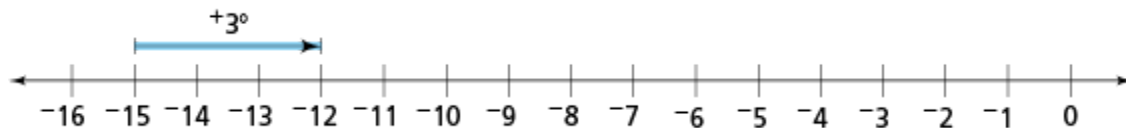


3. $5 - ^\circ\text{F}$; $25^\circ + 30^\circ = 5 - ^\circ$ - or $25^\circ - 30^\circ = 5 - ^\circ$

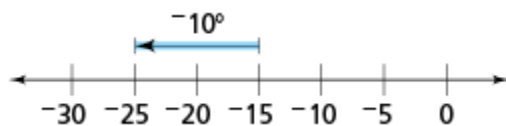


C.

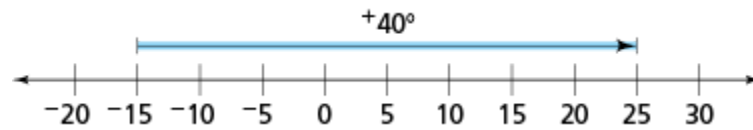
1. $12 - ^\circ\text{F}$; $15 - ^\circ + 3^\circ = 12 - ^\circ$



2. $25 - ^\circ\text{F}$; $15 - ^\circ + 10^\circ = 25 - ^\circ$ - or $15 - ^\circ - 10^\circ = 25 - ^\circ$ -

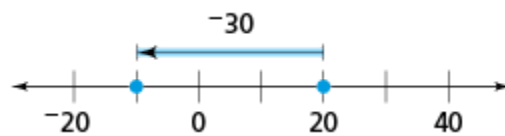


3. 25°F ; $15^{\circ} + 40^{\circ} = 25^{\circ} -$

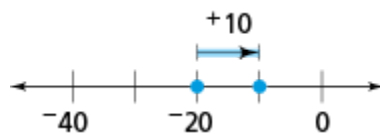


D. Note: It is very important that students write number sentences, not just find the temperature differences.

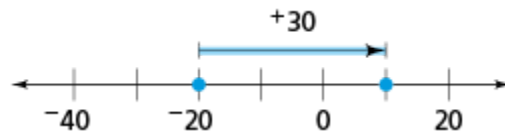
1. 30°F ; $20^{\circ} + n = 10^{\circ} -$ or $20^{\circ} + 30^{\circ} - = 10^{\circ} -$ or $10^{\circ} - 20^{\circ} = 30^{\circ} - -$



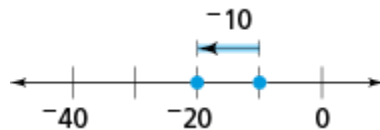
2. 10°F ; $20^{\circ} - n = 10^{\circ} -$ or $20^{\circ} - 10^{\circ} = 10^{\circ} -$ or $10^{\circ} - 20^{\circ} = 10^{\circ} - -$



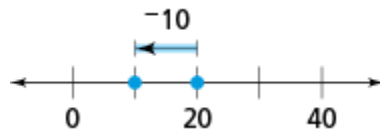
3. 30°F ; $20^{\circ} + n = 10^{\circ}$ – or $20^{\circ} + 30^{\circ} = 10^{\circ}$ – or $10^{\circ} - 20^{\circ} = 30^{\circ}$ –



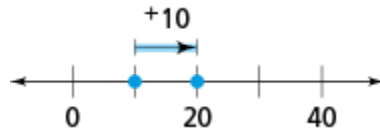
4. 10°F ; $10^{\circ} + n = 20^{\circ}$ – or $10^{\circ} + 10^{\circ} = 20^{\circ}$ – or $20^{\circ} - 10^{\circ} = 10^{\circ}$ – – –



5. 10°F ; $20^{\circ} + n = 10^{\circ}$ or $20^{\circ} + 10^{\circ} = 10^{\circ}$ – or $10^{\circ} - 20^{\circ} = 10^{\circ}$ –



6. 10°F ; $10^{\circ} + n = 20^{\circ}$ or $10^{\circ} + 10^{\circ} = 20^{\circ}$ or $20^{\circ} - 10^{\circ} = 10^{\circ}$



7. Possible strategy:

To determine the size of the temperature change, find the absolute values of both temperatures. If the temperatures have the same sign, subtract the lesser absolute value from the greater absolute value. If the temperatures have different signs, add the absolute values of the temperatures.

To determine the sign of the temperature change, if the resulting temperature is less than the starting temperature, the change in temperature is negative. If the resulting temperature is greater than the starting temperature, the change in temperature is positive.

40°F ; I drew a number line to model the situation (see

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, OR I used a number sentence:

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$5^{\circ} + 20^{\circ} + 25^{\circ} + 40^{\circ} + 70^{\circ} = 40^{\circ}$ – – – or $5^{\circ} + 20^{\circ} - 25^{\circ} + 40^{\circ} - 70^{\circ} = 40^{\circ}$ – –

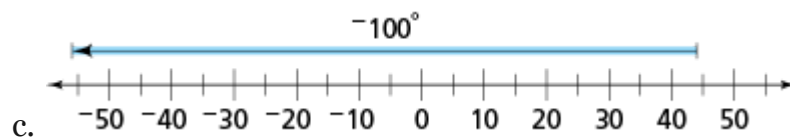
Corresponding ACE Answers

36.41
 37.2
 38.8 –
 39.0
 40.10
 41.2 –
 42.4 –
 43.3 –
 44.5 –
 45.11 –

46.3 – ; 7.5 – ; and 2 2 3
 0; (additive inverses)

47.

- a. It fell by 100° ($100 - ^\circ$). $56 - ^\circ - 44 ^\circ = 100 - ^\circ$
 b. $56 - ^\circ - 44 ^\circ = 100 - ^\circ$ or $44 ^\circ + 100 - ^\circ = 56 - ^\circ$



48. $A = 25 -$; $B = 10 -$; $C = 20$

- a. The change from A to B is 15 units. $25 + n = 10 -$ or $10 - 25 - = n$; $n = 15$
- b. The change from A to C is 45 units. $25 - + n = 20$ or $20 - 25 - = n$; $n = 45$
- c. The change from B to C is 30 units. $10 - + n = 20$ or $20 - 10 - = n$; $n = 30$
- d. The change from C to A is 45 - units. $20 + n = 25 -$ or $25 - - 20 = n$; $n = 45 -$
- e. The change from B to A is 15 - units. $10 + n = 25 -$ or $25 - 10 - = n$; $n = 15 -$
- f. The change from C to B is 30 - units. $20 + n = 10 -$ or $10 - - 20 = n$; $n = 30 -$