

[Illustrative Mathematics](#)

1.OA Valid Equalities?

[Alignment 1: 1.OA.D.7](#)

Decide if the equations are "true" or "false." Make sure you can explain your answer.

a. $2 + 5 = 6$

b. $3 + 4 = 2 + 5$

c. $8 = 4 + 4$

d. $3 + 4 + 2 = 4 + 5$

e. $5 + 3 = 8 + 1$

f. $1 + 2 = 12$

g. $12 = 10 + 2$

h. $3 + 2 = 2 + 3$

i. $32 = 23$

Commentary:

While the written answers are simple "true" or "false" responses, students need to be working in a setting where they have opportunities to elaborate with verbal explanations.

Many of these problems naturally lead to discussions of topics such as place value and properties of addition.

Solution: Some possible explanations.

While the question asks for simple "true" or "false" answers, complete solutions include some valid explanation. There are many possible explanations, so we give a variety of kinds of explanations in these solutions.

- a. False. $2 + 5$ equals 7 and not 6.
- b. True. Both sides equal 7.
- c. True. Since $4 + 4 = 8$, $8 = 4 + 4$.
- d. True. We can combine the three and the two on the left to get 5, and then after reordering both sides are $4 + 5$.
- e. False. $3 + 5$ is 8 but $8 + 1$ is 9.
- f. False. $1 + 2 = 3$, which is less than 12.
- g. True. If you count up two from 10 you get 12. (Alternately, 12 means one ten and two ones.)
- h. True. You can always change the order of numbers being added.
- i. False. 32 is 3 tens and 2 ones. 23 is 2 tens and 3 ones.



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