

Being a *smart* calculator Problem

Adapted from Robert J. Reed, Brown M-S, Newton, MA

Before each calculation, look for a key step that can help you work the entire calculation in your head. Perform the calculation, and show the key step that makes it easier.

	answer	key step
ex. $6\frac{3}{4} + 2\frac{5}{6} + 1\frac{1}{4} =$	$10\frac{5}{6}$	$6\frac{3}{4} + 1\frac{1}{4} = 8$ or $\frac{3}{4} + \frac{1}{4} = 1$
1. $3.8 + 5\frac{1}{4} + 6.2 =$	-----	-----
2. $(2.8 + 5\frac{1}{3}) + \frac{2}{3} =$	-----	-----
3. $7 \cdot 5\frac{1}{2} + 7 \cdot 4\frac{1}{2} =$	-----	-----
4. $3(\frac{1}{3} + \frac{1}{6}) =$	-----	-----
5. $4\frac{1}{9} + 10 + 3\frac{8}{9} =$	-----	-----
6. $8\frac{1}{2} \cdot 6\frac{1}{2} + 1\frac{1}{2} \cdot 6\frac{1}{2} =$	-----	-----
7. $6.9 + (3\frac{1}{10} + 2\frac{2}{5}) =$	-----	-----
8. $177 \cdot 31 + 69 \cdot 177 =$	-----	-----
9. $57(100 + 1) =$	-----	-----
10. $3\frac{1}{4}(\frac{4}{13} + 1) =$	-----	-----
11. $.5 \times 6 \times 10 =$	-----	-----
12. $(\frac{2}{3} \times 3\frac{1}{2}) \times \frac{2}{7} =$	-----	-----
13. $22(4 + \frac{1}{2}) =$	-----	-----
14. $44 \times 2\frac{1}{4} =$	-----	-----
15. $35(10 - \frac{1}{7}) =$	-----	-----

Hints

key step

1. Rearrange the terms.
2. Parentheses *don't* matter here. (Why?)
3. Factoring gives $7 \cdot (\quad + \quad)$.
4. $3 \times \quad + 3 \times \quad$
5. Rearrange terms.
6. Find a common factor.
7. Look at the first two terms.
8. Factor.
9. Don't add first.
10. Don't add first.
11. Rearrange.
12. Ignore parentheses. (Why is that ok?)
13. Don't add first.
14. Think of $44 \times 2\frac{1}{4}$ as $44 \cdot (2 + \frac{1}{4})$.
15. Don't subtract first.

Answers

	answer	key step
1.	$3.8 + 5\frac{1}{4} + 6.2 = 15\frac{1}{4}$	$.2 + .8$ or $3.8 + 6.2$
2.	$(2.8 + 5\frac{1}{3}) + \frac{2}{3} = 8.8$	$\frac{1}{3} + \frac{2}{3}$
3.	$7 \cdot 5\frac{1}{2} + 7 \cdot 4\frac{1}{2} = 70$	$5\frac{1}{2} + 4\frac{1}{2}$
4.	$3(\frac{1}{3} + \frac{1}{6}) = 1\frac{1}{2}$	multiply through to get $1 + \frac{3}{6}$
5.	$4\frac{1}{9} + 10 + 3\frac{8}{9} = 18$	$\frac{1}{9} + \frac{8}{9}$
6.	$8\frac{1}{2} \cdot 6\frac{1}{2} + 1\frac{1}{2} \cdot 6\frac{1}{2} = 65$	$8\frac{1}{2} + 1\frac{1}{2}$
7.	$6.9 + (3\frac{1}{10} + 2\frac{2}{5}) = 12\frac{2}{5}$	$6.9 + 3.1$
8.	$177 \cdot 31 + 69 \cdot 177 = 17700$	$31 + 69$
9.	$57(100 + 1) = 5757$	$57 \cdot 100 + 57 \cdot 1$
10.	$3\frac{1}{4}(\frac{4}{13} + 1) = 4\frac{1}{4}$	$\frac{13}{4} \cdot \frac{4}{13} + 3\frac{1}{4} \cdot 1 = 1 + 3\frac{1}{4}$
11.	$.5 \times 6 \times 10 = 30$	$.5 \times 10$
12.	$(\frac{2}{3} \times 3\frac{1}{2}) \times \frac{2}{7} = \frac{2}{3}$	$\frac{7}{2} \times \frac{2}{7}$
13.	$22(4 + \frac{1}{2}) = 99$	$22 \times \frac{1}{2}$
14.	$44 \times 2\frac{1}{4} = 99$	$44 \times \frac{1}{4}$
15.	$35(10 - \frac{1}{7}) = 345$	$350 - \frac{1}{7} \cdot 35$

Solutions

		answer	key step
1.	$3.8 + 5\frac{1}{4} + 6.2 =$	$15\frac{1}{4}$	$.2 + .8 = 1$ or $3.8 + 6.2 = 10$
2.	$(2.8 + 5\frac{1}{3}) + \frac{2}{3} =$	8.8	$5\frac{1}{3} + \frac{2}{3} = 6$
3.	$7 \cdot 5\frac{1}{2} + 7 \cdot 4\frac{1}{2} =$	70	$7 \cdot (5\frac{1}{2} + 4\frac{1}{2}) = 7 \cdot 10$
4.	$3(\frac{1}{3} + \frac{1}{6}) =$	$1\frac{1}{2}$	$3 \cdot \frac{1}{3} + 3 \cdot \frac{1}{6} = 1 + \frac{3}{6}$
5.	$4\frac{1}{9} + 10 + 3\frac{8}{9} =$	18	$4\frac{1}{9} + 3\frac{8}{9} = 7\frac{9}{9} = 8$
6.	$8\frac{1}{2} \cdot 6\frac{1}{2} + 1\frac{1}{2} \cdot 6\frac{1}{2} =$	65	$(8\frac{1}{2} + 1\frac{1}{2}) \cdot 6\frac{1}{2} = 10 \cdot 6.5$
7.	$6.9 + (3\frac{1}{10} + 2\frac{2}{5}) =$	$12\frac{2}{5}$	$6.9 + 3\frac{1}{10} = 6.9 + 3.1 = 10$
8.	$177 \cdot 31 + 69 \cdot 177 =$	17700	$177 \cdot (31 + 69) = 177 \cdot 100$
9.	$57(100 + 1) =$	5757	$57 \cdot 100 + 57 \cdot 1$
10.	$3\frac{1}{4}(\frac{4}{13} + 1) =$	$4\frac{1}{4}$	$3\frac{1}{4} = \frac{13}{4}$ and $\frac{13}{4} \cdot \frac{4}{13} = 1$
	so $3\frac{1}{4}(\frac{4}{13} + 1) =$	$\frac{13}{4} \cdot \frac{4}{13} + 3\frac{1}{4} \cdot 1 =$	$1 + 3\frac{1}{4}$
11.	$.5 \times 6 \times 10 =$	30	$.5 \times 6 \times 10 = (.5 \times 10) \times 6$
12.	$(\frac{2}{3} \times 3\frac{1}{2}) \times \frac{2}{7} =$	$\frac{2}{3}$	$3\frac{1}{2} \times \frac{2}{7} = \frac{7}{2} \times \frac{2}{7} = 1$
13.	$22(4 + \frac{1}{2}) =$	99	$22 \times \frac{1}{2} = 11$
14.	$44 \times 2\frac{1}{4} =$	99	$44 \times \frac{1}{4} = 11$
15.	$35(10 - \frac{1}{7}) =$	345	$350 - \frac{1}{7} \cdot 35$