
CH 4 – MEASUREMENTS

□ Examples

Here are the basic facts you must memorize in order to do the problems in this chapter:

16 ounces (oz) = 1 pound (lb)

12 inches (in) = 1 foot (ft)

EXAMPLE 1: Find the sum: 3 lb 10 oz + 4 lb 11 oz

Solution: We use the “carrying” idea from adding in elementary school. First line up the units:

$$\begin{array}{r} 3 \text{ lb } 10 \text{ oz} \\ + 4 \text{ lb } 11 \text{ oz} \\ \hline \end{array}$$

Add the ounces and then add the pounds:

$$\begin{array}{r} 3 \text{ lb } 10 \text{ oz} \\ + 4 \text{ lb } 11 \text{ oz} \\ \hline 7 \text{ lb } 21 \text{ oz} \end{array}$$



Since 21 ounces is more than 1 pound, convert 21 ounces to 1 lb 5 oz. Carry the 1 pound over to the lb column and leave the 5 ounces:

$$\begin{array}{r} [1 \text{ lb}] \\ 3 \text{ lb } 10 \text{ oz} \\ + 4 \text{ lb } 11 \text{ oz} \\ \hline 8 \text{ lb } 5 \text{ oz} \end{array}$$

EXAMPLE 2: Find the difference: 8 ft 3 in – 3 ft 10 in

Solution: In this example we use the “borrowing” idea from basic arithmetic.

$$\begin{array}{r} 8 \text{ ft } 3 \text{ in} \\ - 3 \text{ ft } 10 \text{ in} \\ \hline \end{array}$$

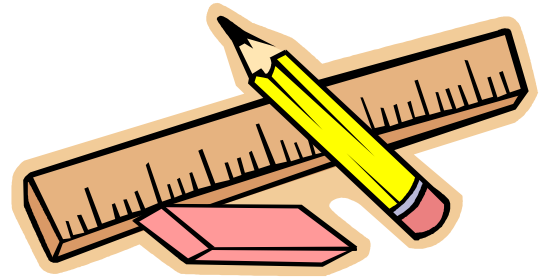
We can't subtract 10 inches from 3 inches, so let's “borrow” one of the feet from the 8 feet.

$$\begin{array}{r} \overset{7}{\cancel{8}} \text{ ft } 3 \text{ in } (+ 12 \text{ in}) \\ - 3 \text{ ft } 10 \text{ in} \\ \hline \end{array}$$

Doing this will leave 7 feet on the top, and the 3 inches will become 15 inches (3 inches + the borrowed 12 inches) -- now the subtraction is easy:

$$\begin{array}{r} 7 \text{ ft } 15 \text{ in} \\ - 3 \text{ ft } 10 \text{ in} \\ \hline 4 \text{ ft } 5 \text{ in} \end{array}$$

The term “borrowing” isn't a very good term to describe what we're doing; after all, we never pay it back. A better term is “exchanging,” since we're exchanging 1 foot for 12 inches in this problem.



Homework

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|-----|-------------------------------------------------------------|-----|--------------------------------------------------------------|-----|---------------------------------|
| 1. | $24 \text{ oz} + 19 \text{ oz}$ | 2. | $1 \text{ lb} - 15 \text{ oz}$ | 3. | $4 \text{ lb} - 12 \text{ oz}$ |
| 4. | $22 \text{ oz} + 2 \text{ oz}$ | 5. | $2 \text{ lb} - 3 \text{ oz}$ | 6. | $5 \text{ lb} - 15 \text{ oz}$ |
| 7. | $8 \text{ lb} + 7 \text{ oz}$ | 8. | $88 \text{ oz} + 2 \text{ oz}$ | 9. | $23 \text{ lb} - 9 \text{ oz}$ |
| 10. | $8 \text{ lb } 2 \text{ oz} + 5 \text{ lb } 15 \text{ oz}$ | 11. | $4 \text{ lb } 7 \text{ oz} - 2 \text{ lb } 9 \text{ oz}$ | 12. | $8 \text{ oz} + 8 \text{ oz}$ |
| 13. | $1 \text{ lb } 15 \text{ oz} + 2 \text{ lb } 13 \text{ oz}$ | 14. | $12 \text{ lb } 1 \text{ oz} - 11 \text{ lb } 15 \text{ oz}$ | 15. | $3 \text{ lb} - 1 \text{ oz}$ |
| 16. | $20 \text{ in} + 30 \text{ in}$ | 17. | $8 \text{ ft} - 9 \text{ in}$ | 18. | $7 \text{ ft} - 11 \text{ in}$ |
| 19. | $32 \text{ in} + 16 \text{ in}$ | 20. | $2 \text{ ft} - 1 \text{ in}$ | 21. | $17 \text{ ft} - 9 \text{ in}$ |
| 22. | $3 \text{ ft } 11 \text{ in} - 9 \text{ in}$ | 23. | $5 \text{ ft } 5 \text{ in} - 3 \text{ ft } 7 \text{ in}$ | 24. | $1 \text{ ft} - 6 \text{ in}$ |
| 25. | $2 \text{ ft } 8 \text{ in} + 3 \text{ ft } 9 \text{ in}$ | 26. | $8 \text{ ft } 2 \text{ in} - 6 \text{ ft } 2 \text{ in}$ | 27. | $12 \text{ in} - 1 \text{ in}$ |
| 28. | $4 \text{ ft } 1 \text{ in} - 3 \text{ ft } 11 \text{ in}$ | 29. | $20 \text{ ft} - 2 \text{ ft } 8 \text{ in}$ | 30. | $5 \text{ ft} - 9 \text{ in}$ |
| 31. | $12 \text{ oz} + 9 \text{ oz}$ | 32. | $2 \text{ lb} - 14 \text{ oz}$ | 33. | $32 \text{ in} - 2 \text{ in}$ |
| 34. | $2 \text{ lb } 7 \text{ oz} - 1 \text{ lb } 15 \text{ oz}$ | 35. | $10 \text{ ft } 2 \text{ in} - 8 \text{ ft } 11 \text{ in}$ | 36. | $8 \text{ ft} - 8 \text{ in}$ |
| 37. | $2 \text{ ft } 11 \text{ in} + 3 \text{ ft } 11 \text{ in}$ | 38. | $3 \text{ lb } 4 \text{ oz} + 2 \text{ lb}$ | 39. | $10 \text{ lb} - 1 \text{ oz}$ |
| 40. | $9 \text{ lb } 12 \text{ oz} - 1 \text{ lb } 13 \text{ oz}$ | 41. | $3 \text{ ft } 7 \text{ in} - 11 \text{ in}$ | 42. | $100 \text{ ft} - 2 \text{ in}$ |

Solutions

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|----|-------------------------------|----|-------------------------------|----|------------------------------|
| 1. | $2 \text{ lb } 11 \text{ oz}$ | 2. | 1 oz | 3. | $3 \text{ lb } 4 \text{ oz}$ |
| 4. | $1 \text{ lb } 8 \text{ oz}$ | 5. | $1 \text{ lb } 13 \text{ oz}$ | 6. | $4 \text{ lb } 1 \text{ oz}$ |

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|-----|------------|-----|------------|-----|-------------|
| 7. | 8 lb 7 oz | 8. | 5 lb 10 oz | 9. | 22 lb 7 oz |
| 10. | 14 lb 1 oz | 11. | 1 lb 14 oz | 12. | 1 lb |
| 13. | 4 lb 12 oz | 14. | 2 oz | 15. | 2 lb 15 oz |
| 16. | 4 ft 2 in | 17. | 7 ft 3 in | 18. | 6 ft 1 in |
| 19. | 4 ft | 20. | 1 ft 11 in | 21. | 16 ft 3 in |
| 22. | 3 ft 2 in | 23. | 1 ft 10 in | 24. | 6 in |
| 25. | 6 ft 5 in | 26. | 2 ft | 27. | 11 in |
| 28. | 2 in | 29. | 17 ft 4 in | 30. | 4 ft 3 in |
| 31. | 1 lb 5 oz | 32. | 1 lb 2 oz | 33. | 2 ft 6 in |
| 34. | 8 oz | 35. | 1 ft 3 in | 36. | 7 ft 4 in |
| 37. | 6 ft 10 in | 38. | 5 lb 4 oz | 39. | 9 lb 15 oz |
| 40. | 7 lb 15 oz | 41. | 2 ft 8 in | 42. | 99 ft 10 in |

□ To ∞ and Beyond

Find the sum of 7 yd 2 ft 7 in and 6 yd 2 ft 11 in

***“Ninety-nine percent of the failures
come from people who have the habit
of making excuses.”***

– George Washington