

Grade 6 · Greatest Common Factor and Least Common Multiple · Worksheet Answer Key

Common Core 6.NS.B.4 · mathovore.fr

This answer key gives a full worked solution for each of the 20 problems, using prime factorizations and lists of multiples. Each word problem states whether the GCF or the LCM is needed and why.

Grade 6 Common Core: 6.NS.B.4

Problem 1: List the factors

Test pairs that multiply to 36: 1×36 , 2×18 , 3×12 , 4×9 , 6×6 .

1, 2, 3, 4, 6, 9, 12, 18, 36

Problem 2: Factors of 30

Test pairs that multiply to 30: 1×30 , 2×15 , 3×10 , 5×6 . The next pair would repeat, so stop.

1, 2, 3, 5, 6, 10, 15, 30

Problem 3: Prime or Composite

A prime number has exactly two factors, 1 and itself. A composite number has more than two factors.

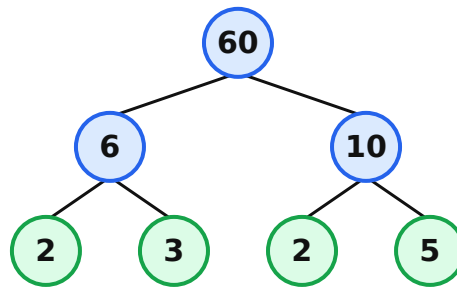
- a. 17 has only the factors 1 and 17: **prime**
- b. $21 = 3 \times 7$: **composite**
- c. $39 = 3 \times 13$: **composite**
- d. 53 is not divisible by 2, 3, 5, or 7, and the factors to test stop at 7 because $8^2 = 64 > 53$: **prime**
- e. $91 = 7 \times 13$: **composite**

Problem 4: Prime factorization

Split 60 into 6×10 , then split each: $6 = 2 \times 3$ and $10 = 2 \times 5$. So $60 = 2 \times 2 \times 3 \times 5$.

Check: $4 \times 3 \times 5 = 60$.

$2^2 \times 3 \times 5$

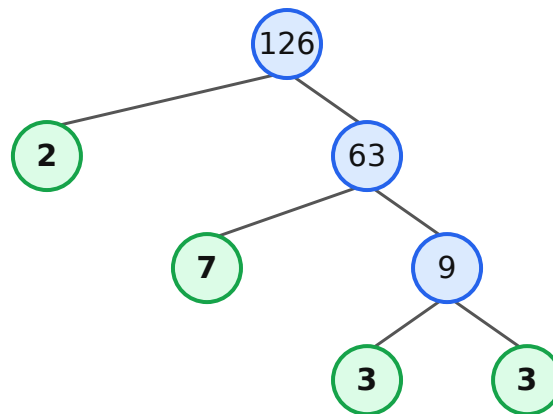


$$60 = 2 \times 2 \times 3 \times 5$$

Problem 5: More Prime Factorizations

- a. $45 = 5 \times 9 = 5 \times 3 \times 3: 3^2 \times 5$
- b. $100 = 10 \times 10 = 2 \times 5 \times 2 \times 5: 2^2 \times 5^2$
- c. $126 = 2 \times 63 = 2 \times 7 \times 9 = 2 \times 7 \times 3 \times 3: 2 \times 3^2 \times 7$
- d. $168 = 8 \times 21 = 2 \times 2 \times 2 \times 3 \times 7: 2^3 \times 3 \times 7$

Check part (c): $2 \times 9 \times 7 = 126$.



Factor tree of 126: $2 \times 3^2 \times 7$.

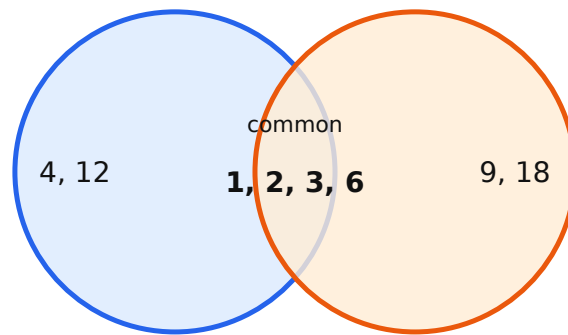
Problem 6: GCF of two small numbers

Factors of 12: 1, 2, 3, 4, 6, 12. Factors of 18: 1, 2, 3, 6, 9, 18. The common factors are 1, 2, 3, and 6.

$$\text{GCF} = 6$$

Factors of 12

Factors of 18



The GCF is the greatest number in the overlap: 6.

Problem 7: GCF of Four Pairs

- a. $16 = 2^4$ and $40 = 2^3 \times 5$. Shared: three 2s. $GCF = 8$
- b. $27 = 3^3$ and $45 = 3^2 \times 5$. Shared: two 3s. $GCF = 9$
- c. $54 = 2 \times 3^3$ and $90 = 2 \times 3^2 \times 5$. Shared: one 2 and two 3s, $2 \times 9 = 18$. $GCF = 18$
- d. $35 = 5 \times 7$ and $36 = 2^2 \times 3^2$ share no prime factor. $GCF = 1$

Problem 8: GCF of larger numbers

$48 = 2 \times 2 \times 2 \times 2 \times 3$ and $72 = 2 \times 2 \times 2 \times 3 \times 3$. Shared primes: three 2s and one 3. $2 \times 2 \times 2 \times 3 = 24$.

Check: $48 \div 24 = 2$ and $72 \div 24 = 3$.

$GCF = 24$

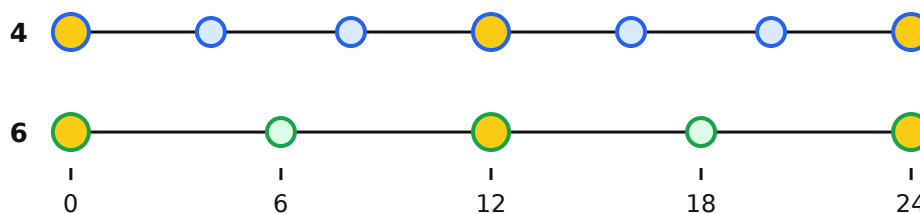
Problem 9: Multiples and Common Multiples

Multiples of 4: 4, 8, 12, 16, 20, 24.

Multiples of 6: 6, 12, 18, 24, 30, 36.

Common multiples in both lists: 12 and 24. The smallest is 12.

$LCM = 12$

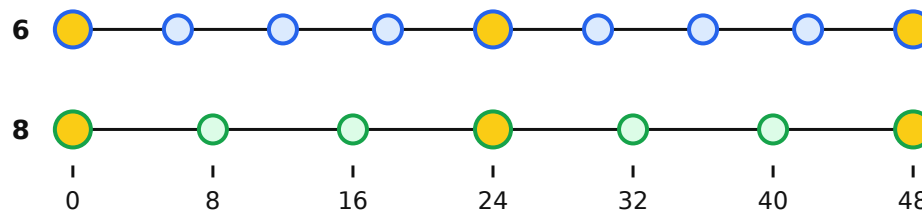


The rows meet first at 12.

Problem 10: LCM of 6 and 8

Multiples of 8: 8, 16, 24. Is 8 a multiple of 6? No. Is 16? No. Is 24? $6 \times 4 = 24$, yes.

LCM = 24



Multiples of 6 and 8 first meet at 24.

Problem 11: LCM of Four Pairs

- a. Multiples of 10: 10, 20. $20 \div 4 = 5$, so LCM = 20
- b. 5 and 7 share no factor except 1, so multiply: $5 \times 7 = 35$. LCM = 35
- c. Multiples of 12: 12, 24, 36, 48, 60. The first one divisible by 10 is 60. LCM = 60
- d. 3 and 11 share no factor except 1: $3 \times 11 = 33$. LCM = 33

Problem 12: LCM of 9 and 12

Multiples of 12: 12, 24, 36. 12 is not divisible by 9, 24 is not, but $9 \times 4 = 36$.

LCM = 36

Problem 13: Factor a sum

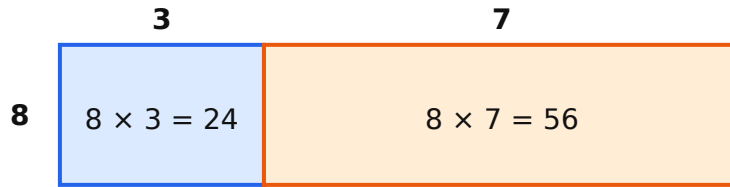
$54 = 2 \times 3^3$ and $36 = 2^2 \times 3^2$. The GCF is $2 \times 3^2 = 18$. Divide each addend by 18: $54 \div 18 = 3$ and $36 \div 18 = 2$.

So $54 + 36 = 18(3 + 2)$. Check: $54 + 36 = 90$ and $18 \times 5 = 90$.

$18(3 + 2)$

Problem 14: Factor Four Sums

- a. $\text{GCF}(24, 56) = 8$. $24 + 56 = 8(3 + 7)$. Check: $80 = 8 \times 10$. $8(3 + 7)$
- b. $\text{GCF}(45, 75) = 15$. $45 + 75 = 15(3 + 5)$. Check: $120 = 15 \times 8$. $15(3 + 5)$
- c. $\text{GCF}(84, 36) = 12$. $84 + 36 = 12(7 + 3)$. Check: $120 = 12 \times 10$. $12(7 + 3)$
- d. $\text{GCF}(100, 35) = 5$. $100 + 35 = 5(20 + 7)$. Check: $135 = 5 \times 27$. $5(20 + 7)$



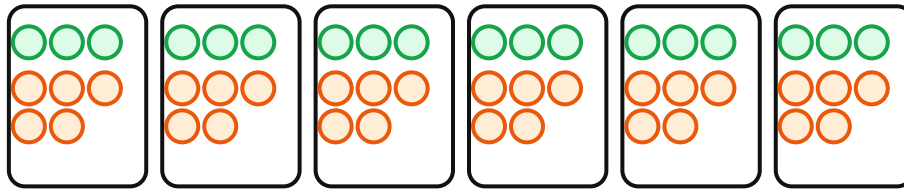
Part (a): $24 + 56 = 8(3 + 7)$.

Problem 15: Fruit baskets

The number of baskets must divide both 36 and 60, so find the GCF. $36 = 2^2 \times 3^2$ and $60 = 2^2 \times 3 \times 5$, so the GCF is $2^2 \times 3 = 12$.

Apples per basket: $36 \div 12 = 3$. Oranges per basket: $60 \div 12 = 5$.

12 baskets, each with 3 apples and 5 oranges.



(first 6 of 12 baskets shown)

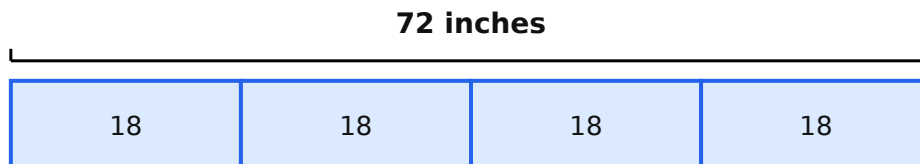
12 baskets (6 shown).

Problem 16: Cutting Boards

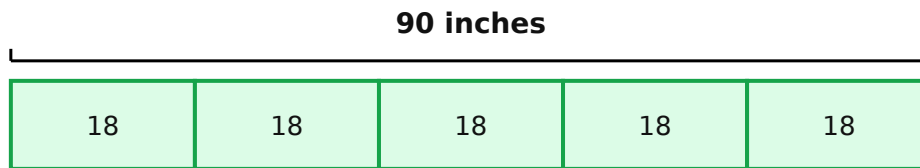
The piece length must divide both 72 and 90, so find the GCF. $72 = 2^3 \times 3^2$ and $90 = 2 \times 3^2 \times 5$. Shared: one 2 and two 3s, so $2 \times 9 = 18$.

Pieces from the 72-inch board: $72 \div 18 = 4$. Pieces from the 90-inch board: $90 \div 18 = 5$.

Each piece is 18 inches; 4 pieces from one board and 5 pieces from the other.



4 pieces of 18 inches make 72 inches.



5 pieces of 18 inches make 90 inches.

Problem 17: Bus schedules

The buses meet again after a number of minutes that is a multiple of both 8 and 12, so find the LCM. Multiples of 12: 12, 24. $24 = 8 \times 3$, so the LCM is 24.

24 minutes after 7:00 AM is 7:24 AM.

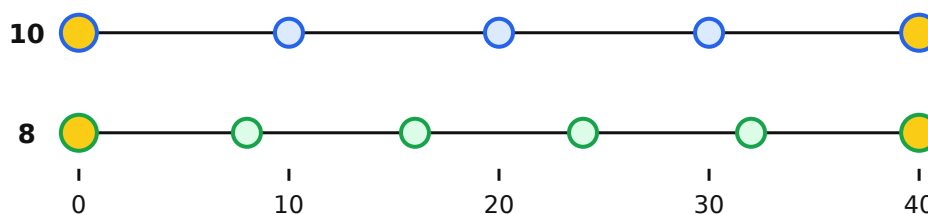
7:24 AM

Problem 18: Hot Dogs and Buns

The totals match at a common multiple of 10 and 8, so find the LCM. Multiples of 10: 10, 20, 30, 40. Is 10 a multiple of 8? No. 20? No. 30? No. 40? $8 \times 5 = 40$, yes.

Hot dog packs: $40 \div 10 = 4$. Bun packs: $40 \div 8 = 5$.

40 hot dogs and 40 buns: 4 packs of hot dogs and 5 packs of buns.



The totals first match at 40.

Problem 19: Sticker sets

$56 = 2^3 \times 7$ and $84 = 2^2 \times 3 \times 7$. The GCF is $2^2 \times 7 = 28$. Sets: 28. Stars per set: $56 \div 28 = 2$. Hearts per set: $84 \div 28 = 3$.

Factored sum: $56 + 84 = 28(2 + 3)$. Check: $140 = 28 \times 5$.

28 sets, each with 2 stars and 3 hearts; $56 + 84 = 28(2 + 3)$.

Problem 20: Joggers on a Track

- a. They meet again after a number of minutes that is a multiple of both 10 and 12, so find the LCM. Multiples of 12: 12, 24, 36, 48, 60. The first multiple of 10 in the list is 60, so $\text{LCM} = 60$. 60 minutes after 3:30 PM is 4:30 PM. **4:30 PM**
- b. Noah: $60 \div 10 = 6$ laps. Mei: $60 \div 12 = 5$ laps. **Noah 6 laps, Mei 5 laps.**