Greatest Common Factor and Least Common Multiple

Greatest common factor and least common multiple: Applications and decisions

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

The GCF is the greatest factor shared by two numbers; the LCM is their first shared positive multiple. For $10, 14$, the GCF is 2 because $10 = 2 \times 5$ and $14 = 2 \times 7$. Their LCM is $(10 \times 14)/2 = 70$. Use GCF for the greatest number of identical groups, and LCM for repeating schedules that start together.

Worked example

Find the GCF of 16 and 24.

1. Factor out 8: $16 = 8 \times 2$ and $24 = 8 \times 3$.
2. The remaining factors 2 and 3 have GCF 1, so the greatest shared factor is 8.
Answer: 8.

Practice Problems

Show your thinking.

1. Use all 28 apples and 42 oranges in the greatest possible number of identical bags. How many bags?

2. Two shuttles leave every 12 and 18 minutes. They leave now. Find minutes until their next shared departure.

3. Cover the entire 30-cm by 45-cm board with identical uncut square tiles, without gaps or overlaps. Find the largest possible tile side.

4. Buy pencils in packs of 8 and erasers in packs of 14. What smallest equal positive item count can be bought?

5. Make the greatest number of identical prize bags using all 32 stickers and all 48 cards. How many bags and what is in one bag?

6. Two gardens are watered today. Their cycles repeat every 15 and 20 days. How many days until both are watered on the same day again?

Answer Key

1. 14 identical bags.
2. 36 minutes.
3. 15 cm per side.
4. 56 of each item.
5. 16 bags, each with 2 stickers and 3 cards.
6. 60 days.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Factor out 14: $28 = 14 \times 2$ and $42 = 14 \times 3$.

2. The remaining factors 2 and 3 have GCF 1, so the greatest shared factor is 14.

Problem 2

1. GCF $= 6$, so LCM $= (12 \times 18)/6 = 36$.

2. Check $36/12 = 3$ and $36/18 = 2$ are whole; no smaller positive common multiple occurs.

Problem 3

1. Factor out 15: $30 = 15 \times 2$ and $45 = 15 \times 3$.

2. The remaining factors 2 and 3 have GCF 1, so the greatest shared factor is 15.

3. An uncut tile side must divide both board lengths. At 15 cm, there are $30/15 = 2$ tiles by $45/15 = 3$ tiles, so the whole board is covered.

Problem 4

1. GCF $= 2$, so LCM $= (8 \times 14)/2 = 56$.

2. Check $56/8 = 7$ and $56/14 = 4$ are whole; no smaller positive common multiple occurs.

Problem 5

1. Factor out 16: $32 = 16 \times 2$ and $48 = 16 \times 3$.

2. The remaining factors 2 and 3 have GCF 1, so the greatest shared factor is 16.

3. Each bag has $32/16 = 2$ stickers and $48/16 = 3$ cards. All items are used.

Problem 6

1. GCF $= 5$, so LCM $= (15 \times 20)/5 = 60$.

2. Check $60/15 = 4$ and $60/20 = 3$ are whole; no smaller positive common multiple occurs.

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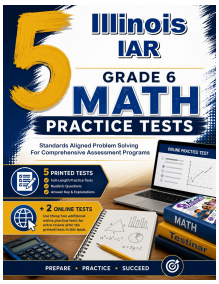

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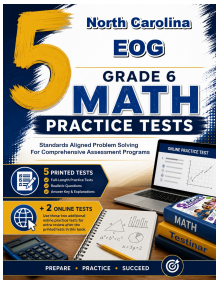

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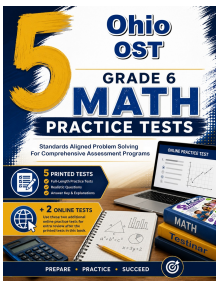

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