

Factors and Multiples: math test solutions, Grade 6 – download the PDF

Test solutions with the detailed point scale. Add up your points and spot what to review.

Suggested time: 45 minutes. Out of 20 points. Calculator allowed only when the problem says so.

1 Vocabulary and lists

/ 4 pts

- a. $1 \times 40, 2 \times 20, 4 \times 10, 5 \times 8$: the factors are **1, 2, 4, 5, 8, 10, 20, 40**. (1 pt)
- b. **15, 30, 45, 60, 75**. (1 pt)
- c. Composite, because **$57 = 3 \times 19$** (its digit sum **12** is divisible by **3**). (1 pt)
- d. **23, 43** and **53** are prime; **$33 = 3 \times 11$** is composite. (1 pt)

2 Divisibility

/ 3 pts

- a. It ends in **6**: divisible by **2**. The digit sum is **$7 + 2 + 3 + 6 = 18$** : divisible by **3** and **9**, hence by **6**. The last two digits **$36 = 4 \times 9$** : divisible by **4**. It does not end in **0** or **5**: not divisible by **5** or **10**. So **2, 3, 4, 6, 9** divide it. (2 pts)
- b. For **5**, the last digit is **0** or **5**. The digit sum **$4 + 8 + \square = 12 + \square$** must be a multiple of **3**: **$\square = 0$** works (sum **12**), **$\square = 5$** does not (sum **17**). The number is **480**. (1 pt)

3 Prime factorization

/ 3 pts

- a. $180 = 18 \times 10 = (2 \times 3 \times 3) \times (2 \times 5)$, so $180 = 2^2 \times 3^2 \times 5$. (2 pts)
- b. $12 = 2^2 \times 3$ and both 2^2 and 3 appear in the factorization of 180 , so $180 = 12 \times 15$. (1 pt)

4 GCF and LCM

/ 4 pts

$45 = 3^2 \times 5$ and $75 = 3 \times 5^2$.

- a. Smaller exponents: $3 \times 5 = 15$, so **GCF = 15**. (2 pts)
- b. Larger exponents: $3^2 \times 5^2 = 225$, so **LCM = 225**. Check:
 $15 \times 225 = 3,375 = 45 \times 75$. (2 pts)

5 Distributive property

/ 2 pts

$\text{GCF}(54, 90) = 18$ ($54 = 2 \times 3^3$, $90 = 2 \times 3^2 \times 5$). (1 pt)

$54 + 90 = 18(3 + 5) = 18 \times 8 = 144$. (1 pt)

6 Word problems

/ 4 pts

- a. $84 = 2^2 \times 3 \times 7$ and $108 = 2^2 \times 3^3$, so **GCF = $2^2 \times 3 = 12$** . She sets up **12** stations with $84 \div 12 = 7$ beanbags and $108 \div 12 = 9$ jump ropes each. (2 pts)
- b. **LCM(15, 20) = 60** ($15 = 3 \times 5$, $20 = 2^2 \times 5$, so $2^2 \times 3 \times 5 = 60$). They are together again **60** minutes later, at 7:00 a.m. (2 pts)



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