

LESSON 4

Greatest Common Factor

The greatest common factor, “GCF” of two or more whole numbers can be found by inspecting their prime factorizations for like primes.

Example 1: Find the greatest common factor of 12 and 18.

- Write a prime factorization for both numbers
- Underline the like primes
- Multiply the primes that have been underlined in either factorization $2 \times 3 = 6$
- Therefore the greatest common factor of $(12, 18) = 6$

$$12 = \underline{2} \times 2 \times \underline{3}$$

$$18 = \underline{2} \times \underline{3} \times 3$$

Example 2: Find the gcf of 54, 72, 90

$$54 = \underline{2} \times \underline{3} \times \underline{3} \times 3$$

$$72 = \underline{2} \times 2 \times 2 \times \underline{3} \times \underline{3}$$

$$90 = \underline{2} \times \underline{3} \times \underline{3} \times 5$$

$$\text{GCF } (54, 72, 90) = \underline{2} \times \underline{3} \times \underline{3} = 18$$

If there are no primes in common the gcf = 1.

The numbers are relatively prime to each other.

Find The GCF Of Each Group Of Numbers Using Prime Factorizations

1. $20 = \underline{2} \times \underline{2} \times \underline{5}$ $90 = \underline{2} \times \underline{3} \times \underline{3} \times \underline{5}$	GCF 10	11. $85 = \underline{5} \times 17$ $95 = \underline{5} \times 19$	5
2. $42 = \underline{2} \times \underline{3} \times \underline{7}$ $98 = \underline{2} \times \underline{7} \times \underline{7}$	14	12. $32 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2}$ $60 = \underline{2} \times \underline{2} \times \underline{3} \times \underline{5}$	4
3. $27 = \underline{3} \times \underline{3} \times \underline{3}$ $63 = \underline{3} \times \underline{3} \times \underline{7}$	9	13. $18 = \underline{2} \times \underline{3} \times \underline{3}$ $30 = \underline{2} \times \underline{3} \times \underline{5}$	6
4. $48 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{3}$ $64 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2}$	16	14. $34 = \underline{2} \times \underline{17}$ $51 = \underline{3} \times \underline{17}$	17
5. $39 = \underline{3} \times \underline{13}$ $91 = \underline{7} \times \underline{13}$	13	15. $49 = \underline{7} \times \underline{7}$ $63 = \underline{3} \times \underline{3} \times \underline{7}$	7
6. $46 = \underline{2} \times \underline{23}$ $69 = \underline{3} \times \underline{23}$	23	16. $57 = \underline{3} \times \underline{19}$ $76 = \underline{2} \times \underline{2} \times \underline{19}$	19
7. $30 = \underline{2} \times \underline{3} \times \underline{5}$ $78 = \underline{2} \times \underline{3} \times \underline{13}$	6	17. $66 = \underline{3} \times \underline{2} \times \underline{11}$ $88 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{11}$	22
8. $54 = \underline{2} \times \underline{3} \times \underline{3} \times \underline{3}$ $81 = \underline{3} \times \underline{3} \times \underline{3} \times \underline{3}$	27	18. $54 = \underline{2} \times \underline{3} \times \underline{3} \times \underline{3}$ $72 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times \underline{3}$	18
9. $44 = \underline{2} \times \underline{2} \times \underline{11}$ $77 = \underline{7} \times \underline{11}$	11	19. $49 = \underline{7} \times \underline{7}$ $70 = \underline{2} \times \underline{5} \times \underline{7}$	7
10. $64 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2}$ $96 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{3}$	32	20. $38 = \underline{2} \times \underline{19}$ $76 = \underline{2} \times \underline{2} \times \underline{19}$	38

Find The GCF Of Each Group Of Numbers Using Prime Factorizations

21. $30 = 2 \times 3 \times \underline{5}$ $85 = \underline{5} \times 17$	GCF 5	31. $27 = \underline{3} \times \underline{3} \times \underline{3}$ $81 = \underline{3} \times \underline{3} \times \underline{3} \times 3$	27
22. $56 = \underline{2} \times 2 \times 2 \times \underline{7}$ $98 = \underline{2} \times 7 \times \underline{7}$	14	32. $60 = \underline{2} \times \underline{2} \times \underline{3} \times 5$ $72 = 2 \times \underline{2} \times \underline{2} \times \underline{3} \times 5$	12
23. $36 = \underline{2} \times 2 \times \underline{3} \times \underline{3}$ $90 = \underline{2} \times \underline{3} \times \underline{3} \times 5$	18	33. $36 = \underline{2} \times \underline{2} \times \underline{3} \times 3$ $60 = \underline{2} \times \underline{2} \times \underline{3} \times 5$	12
24. $44 = \underline{2} \times 2 \times \underline{11}$ $66 = \underline{2} \times 3 \times \underline{11}$	22	34. $84 = \underline{2} \times \underline{2} \times \underline{3} \times 7$ $96 = 2 \times 2 \times 2 \times \underline{2} \times \underline{2} \times 3$	12
25. $45 = 3 \times \underline{3} \times \underline{5}$ $60 = 2 \times 2 \times \underline{3} \times \underline{5}$	15	35. $15 = \underline{3} \times \underline{5}$ $90 = 2 \times 3 \times \underline{3} \times \underline{5}$	15
26. $48 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 3$ $80 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 5$	16	36. $58 = 2 \times \underline{29}$ $87 = 3 \times \underline{29}$	29
27. $72 = \underline{2} \times 2 \times 2 \times \underline{3} \times \underline{3}$ $90 = \underline{2} \times \underline{3} \times \underline{3} \times 5$	18	37. $45 = 3 \times \underline{3} \times \underline{5}$ $75 = \underline{3} \times \underline{5} \times 5$	15
28. $64 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 2 \times 2$ $80 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 5$	16	38. $48 = \underline{2} \times \underline{2} \times \underline{2} \times 2 \times \underline{3}$ $72 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times 3$	24
29. $27 = \underline{3} \times \underline{3} \times 3$ $90 = 2 \times \underline{3} \times \underline{3} \times 5$	9	39. $65 = 5 \times \underline{13}$ $91 = 7 \times \underline{13}$	13
30. $68 = 2 \times 2 \times \underline{17}$ $85 = 5 \times \underline{17}$	17	40. $66 = \underline{2} \times \underline{3} \times 11$ $72 = \underline{2} \times 2 \times 2 \times \underline{3} \times 3$	6

Find The GCF Of Each Group Of Numbers Using Prime Factorizations

<p>41.</p> $9 = \underline{3} \times \underline{3}$ $36 = 2 \times 2 \times \underline{3} \times \underline{3}$ $54 = 2 \times 3 \times \underline{3} \times \underline{3}$	9	<p>46.</p> $30 = 2 \times \underline{3} \times \underline{5}$ $45 = \underline{3} \times 3 \times \underline{5}$ $75 = \underline{3} \times \underline{5} \times 5$	15
<p>42.</p> $24 = \underline{2} \times \underline{2} \times 2 \times \underline{3}$ $60 = \underline{2} \times \underline{2} \times \underline{3} \times 5$ $84 = \underline{2} \times \underline{2} \times \underline{3} \times 7$	12	<p>47.</p> $24 = \underline{2} \times 2 \times 2 \times \underline{3}$ $30 = \underline{2} \times \underline{3} \times 5$ $60 = 2 \times \underline{2} \times \underline{3} \times 5$	6
<p>43.</p> $18 = \underline{2} \times \underline{3} \times 3$ $30 = \underline{2} \times \underline{3} \times 5$ $90 = \underline{2} \times \underline{3} \times 3 \times 5$	6	<p>48.</p> $32 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2}$ $48 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 3$ $80 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 5$	16
<p>44.</p> $48 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 3$ $80 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 5$ $96 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times 2 \times 3$	16	<p>49.</p> $34 = 2 \times \underline{17}$ $51 = 3 \times \underline{17}$ $85 = 5 \times \underline{17}$	17
<p>45.</p> $12 = \underline{2} \times 2 \times \underline{3}$ $36 = \underline{2} \times 2 \times \underline{3} \times 3$ $42 = \underline{2} \times \underline{3} \times 7$	6	<p>50.</p> $18 = 2 \times \underline{3} \times 3$ $45 = \underline{3} \times 3 \times 5$ $75 = \underline{3} \times 5 \times 5$	3