

LESSON 8

Reducing Fractions By Prime Factorization

A fraction can be reduced by writing a prime factorization of the numerator and the denominator then cancelling the like factors.

Example 1: Reduce $\frac{26}{65}$

$$\frac{26}{65} = \frac{2 \times \overset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}}{5 \times \underset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}} = \frac{2}{5}$$

Example 2: Reduce $\frac{52}{65}$

$$\frac{52}{65} = \frac{2 \times 2 \times \overset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}}{5 \times \underset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}} = \frac{4}{5}$$

Example 3: Reduce $\frac{13}{26}$

$$\frac{13}{26} = \frac{\overset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}}{2 \times \underset{\cdot}{\underset{\cdot}{\circlearrowleft}}{13}} = \frac{1}{2}$$

Write The Prime Factorization Find The Reduced Fraction

$1. \frac{33}{77} = \frac{3 \times 11}{7 \times 11} = \frac{3}{7}$	$11. \frac{57}{95} = \frac{3 \times 19}{5 \times 19} = \frac{3}{5}$
$2. \frac{19}{95} = \frac{1 \times 19}{5 \times 19} = \frac{1}{5}$	$12. \frac{41}{82} = \frac{1 \times 41}{2 \times 41} = \frac{1}{2}$
$3. \frac{19}{38} = \frac{1 \times 19}{2 \times 19} = \frac{1}{2}$	$13. \frac{22}{33} = \frac{2 \times 11}{3 \times 11} = \frac{2}{3}$
$4. \frac{13}{65} = \frac{1 \times 13}{5 \times 13} = \frac{1}{5}$	$14. \frac{57}{76} = \frac{3 \times 19}{2 \times 2 \times 19} = \frac{3}{4}$
$5. \frac{34}{68} = \frac{1 \times 2 \times 17}{2 \times 2 \times 17} = \frac{1}{2}$	$15. \frac{34}{51} = \frac{2 \times 17}{3 \times 17} = \frac{2}{3}$
$6. \frac{17}{85} = \frac{1 \times 17}{5 \times 17} = \frac{1}{5}$	$16. \frac{17}{51} = \frac{1 \times 17}{3 \times 17} = \frac{1}{3}$
$7. \frac{62}{93} = \frac{2 \times 31}{3 \times 31} = \frac{2}{3}$	$17. \frac{22}{88} = \frac{1 \times 2 \times 11}{2 \times 2 \times 2 \times 11} = \frac{1}{4}$
$8. \frac{55}{66} = \frac{5 \times 11}{2 \times 3 \times 11} = \frac{5}{6}$	$18. \frac{34}{85} = \frac{2 \times 17}{5 \times 17} = \frac{2}{5}$
$9. \frac{13}{39} = \frac{1 \times 13}{3 \times 13} = \frac{1}{3}$	$19. \frac{23}{46} = \frac{1 \times 23}{2 \times 23} = \frac{1}{2}$
$10. \frac{23}{92} = \frac{1 \times 23}{2 \times 2 \times 23} = \frac{1}{4}$	$20. \frac{43}{86} = \frac{1 \times 43}{2 \times 43} = \frac{1}{2}$

Write The Prime Factorization

Find The Reduced Fraction

$^{21.} \frac{29}{87} = \frac{1 \times 29}{3 \times 29} = \frac{1}{3}$	$^{31.} \frac{22}{55} = \frac{2 \times 11}{5 \times 11} = \frac{2}{5}$
$^{22.} \frac{26}{39} = \frac{2 \times 13}{3 \times 13} = \frac{2}{3}$	$^{32.} \frac{19}{57} = \frac{1 \times 19}{3 \times 19} = \frac{1}{3}$
$^{23.} \frac{47}{94} = \frac{1 \times 47}{2 \times 47} = \frac{1}{2}$	$^{33.} \frac{29}{58} = \frac{1 \times 29}{2 \times 29} = \frac{1}{2}$
$^{24.} \frac{65}{91} = \frac{5 \times 13}{7 \times 13} = \frac{5}{7}$	$^{34.} \frac{23}{69} = \frac{1 \times 23}{3 \times 23} = \frac{1}{3}$
$^{25.} \frac{65}{78} = \frac{5 \times 13}{2 \times 3 \times 13} = \frac{5}{6}$	$^{35.} \frac{26}{91} = \frac{2 \times 13}{7 \times 13} = \frac{2}{7}$
$^{26.} \frac{17}{34} = \frac{1 \times 17}{2 \times 17} = \frac{1}{2}$	$^{36.} \frac{46}{92} = \frac{1 \times 2 \times 23}{2 \times 2 \times 23} = \frac{1}{2}$
$^{27.} \frac{39}{78} = \frac{1 \times 3 \times 13}{2 \times 3 \times 13} = \frac{1}{2}$	$^{37.} \frac{37}{74} = \frac{1 \times 37}{2 \times 37} = \frac{1}{2}$
$^{28.} \frac{17}{68} = \frac{1 \times 17}{2 \times 2 \times 17} = \frac{1}{4}$	$^{38.} \frac{46}{69} = \frac{2 \times 23}{3 \times 23} = \frac{2}{3}$
$^{29.} \frac{39}{65} = \frac{3 \times 13}{5 \times 13} = \frac{3}{5}$	$^{39.} \frac{22}{77} = \frac{2 \times 11}{7 \times 11} = \frac{2}{7}$
$^{30.} \frac{31}{93} = \frac{1 \times 31}{3 \times 31} = \frac{1}{3}$	$^{40.} \frac{26}{52} = \frac{1 \times 2 \times 13}{2 \times 2 \times 13} = \frac{1}{2}$

Write The Prime Factorization

Find The Reduced Fraction

$41. \frac{58}{87} = \frac{2 \times 29}{3 \times 29} = \frac{2}{3}$	$51. \frac{33}{44} = \frac{3 \times 11}{2 \times 2 \times 11} = \frac{3}{4}$
$42. \frac{22}{99} = \frac{2 \times 11}{3 \times 3 \times 11} = \frac{2}{9}$	$52. \frac{26}{78} = \frac{1 \times 2 \times 13}{2 \times 3 \times 13} = \frac{1}{3}$
$43. \frac{39}{52} = \frac{3 \times 13}{2 \times 2 \times 13} = \frac{3}{4}$	$53. \frac{33}{55} = \frac{3 \times 11}{5 \times 11} = \frac{3}{5}$
$44. \frac{33}{66} = \frac{1 \times 3 \times 11}{2 \times 3 \times 11} = \frac{1}{2}$	$54. \frac{78}{91} = \frac{2 \times 3 \times 13}{7 \times 13} = \frac{6}{7}$
$45. \frac{13}{91} = \frac{1 \times 13}{7 \times 13} = \frac{1}{7}$	$55. \frac{22}{66} = \frac{2 \times 11}{2 \times 3 \times 11} = \frac{1}{3}$
$46. \frac{13}{52} = \frac{1 \times 13}{2 \times 2 \times 13} = \frac{1}{4}$	$56. \frac{31}{62} = \frac{1 \times 31}{2 \times 31} = \frac{1}{2}$
$47. \frac{69}{92} = \frac{3 \times 23}{2 \times 2 \times 23} = \frac{3}{4}$	$57. \frac{38}{57} = \frac{2 \times 19}{3 \times 19} = \frac{2}{3}$
$48. \frac{52}{91} = \frac{2 \times 2 \times 13}{7 \times 13} = \frac{4}{7}$	$58. \frac{39}{91} = \frac{3 \times 13}{7 \times 13} = \frac{3}{7}$
$49. \frac{13}{78} = \frac{1 \times 13}{2 \times 3 \times 13} = \frac{1}{6}$	$59. \frac{19}{76} = \frac{1 \times 19}{2 \times 2 \times 19} = \frac{1}{4}$
$50. \frac{52}{78} = \frac{2 \times 2 \times 13}{2 \times 3 \times 13} = \frac{2}{3}$	$60. \frac{38}{95} = \frac{2 \times 19}{5 \times 19} = \frac{2}{5}$