BUILDING A BETTER BIKE
Modifications for a Faster Bike

A fast bike is more compact and lighter weight than a generic bike. The wheels are closer together, making the bike very responsive to steering and maneuvering. The top tube is longer, and most of the other bike tubes are shorter. These changes allow the rider to sit in an aerodynamic position. Weight is trimmed from the bike's wheels, handlebars, seat, and pedals.

The following table shows the length of tubes on the generic bicycle. You will take the starting length of each tube and add or subtract the amount shown in the adjustment column. You may use fraction models or equivalent fractions to solve each problem. Be sure to show or explain how you found the answer. Reduce your answers to simplest terms and write the answers in the last column of the table.

Changes to Length

	Starting Length (in inches)	Adjustment	New Length (in inches)
Top Tube	$21\frac{1}{4}$	add $\frac{15}{16}$	$22\frac{3}{16}$
How I found the answer			

$$21\frac{1}{4} + \frac{15}{16} = 21\frac{(1\times4)}{(4\times4)} + \frac{5}{12} = 21\frac{4}{16} + \frac{15}{16} = 21\frac{19}{16} = 22\frac{3}{16}$$

	Starting Length (in inches)	Adjustment	New Length (in inches)
Seat Tube	$22\frac{1}{8}$	subtract $\frac{3}{8}$	$21\frac{3}{4}$
How I found the answer			

$$22\frac{1}{8} - \frac{3}{8} = 21\frac{9}{8} - \frac{3}{8} = 21\frac{6}{8} = 21\frac{3}{4}$$

	Starting Length (in inches)	Adjustment	New Length (in inches)
Fork	$15\frac{1}{2}$	subtract $1\frac{1}{4}$	$14\frac{1}{4}$

How I found the answer

$$15\frac{1}{2} - 1\frac{1}{4} = 15\frac{(1\times 2)}{(2\times 2)} - 1\frac{1}{4} = 15\frac{2}{4} - 1\frac{1}{4} = 14\frac{1}{4}$$

Head Tube	$6\frac{1}{16}$	subtract $\frac{1}{2}$	$5\frac{9}{16}$

How I found the answer

$$6\frac{1}{16} - \frac{1}{2} = 6\frac{1}{16} - \frac{(1\times 8)}{(2\times 8)} = 6\frac{1}{16} - \frac{8}{16} = 5\frac{17}{16} - \frac{8}{16} = 5\frac{5}{16}$$

Chain Stays	$18\frac{1}{8}$	subtract $1\frac{3}{4}$	$16\frac{3}{8}$

How I found the answer

$$18\frac{1}{8} - 1\frac{3}{4} = 18\frac{1}{8} - 1\frac{(3\times 2)}{(4\times 2)} = 18\frac{1}{8} - 1\frac{6}{8} = 17\frac{9}{8} - 1\frac{6}{8} = 16\frac{3}{8}$$

Wheelbase	$41\frac{5}{8}$	subtract $2\frac{3}{4}$	$38\frac{7}{8}$

How I found the answer

$$41\frac{5}{8} - 2\frac{3}{4} = 41\frac{5}{8} - 2\frac{(3\times 2)}{(4\times 2)} = 41\frac{5}{8} - 2\frac{6}{8} = 40\frac{13}{8} - 2\frac{6}{8} = 38\frac{7}{8}$$