



Question 1

RUBRIC

Score	Description
4	Response demonstrates thorough understanding of using equivalent fractions to add and subtract fractions. <ul style="list-style-type: none">• Student finds a common denominator. (1 point)• Student clearly explains how fractions were converted to equivalent fractions and added or subtracted. (3 point)

SAMPLE RESPONSES

Faster Bike:

$$73\frac{1}{2} - 25\frac{5}{16} = 73\frac{(1 \cdot 8)}{(2 \cdot 8)} - 25\frac{5}{16} = 73\frac{8}{16} - 25\frac{5}{16} = 48\frac{3}{16}$$

I multiplied the top and bottom number in $\frac{1}{2}$ by 8 so that both fractions would have a denominator of 16. Then I subtracted my whole numbers and subtracted the numbers on top in the fraction.

Freestyle Bike:

$$73\frac{1}{2} + 15\frac{3}{16} = 73\frac{(1 \cdot 8)}{(2 \cdot 8)} + 15\frac{3}{16} = 73\frac{8}{16} + 15\frac{3}{16} = 48\frac{3}{16}$$

I multiplied the top and bottom number in $\frac{1}{2}$ by 8 so that both fractions would have a denominator of 16. Then I added my whole numbers and added the numbers on top in the fraction.

More Comfortable Bike:

$$73\frac{1}{2} + 21\frac{3}{8} = 73\frac{(1 \cdot 4)}{(2 \cdot 4)} + 21\frac{3}{8} = 73\frac{4}{8} + 21\frac{3}{8} = 94\frac{7}{8}$$

I multiplied the top and bottom number in $\frac{1}{2}$ by 4 so that both fractions would have a denominator of 8. Then I added the whole numbers and numerators of the fractions.

Question 2**RUBRIC**

Score	Description
4	Response demonstrates thorough understanding of using equivalent fractions to add and subtract fractions. <ul style="list-style-type: none">• Student finds a common denominator. (1 point)• Student clearly explains how fractions were converted to equivalent fractions and added or subtracted. (3 point)

SAMPLE RESPONSES**Faster Bike:**

$$10\frac{5}{16} - 2\frac{3}{4} = 10\frac{5}{16} - 2\frac{(3 \cdot 4)}{(4 \cdot 4)} = 10\frac{5}{16} - 2\frac{12}{16} = 9\frac{21}{16} - 2\frac{12}{16} = 7\frac{9}{16}$$

I multiplied the top and bottom numbers in $\frac{3}{4}$ by 4 so that both fractions would have a denominator of 16. Then I borrowed $\frac{16}{16}$ from 10 so that I could subtract $\frac{12}{16}$. Once I had enough 16ths to subtract from, I subtracted the numbers on top in the fractions and the whole numbers.

Freestyle Bike:

$$10\frac{5}{16} + \frac{3}{8} = 10\frac{5}{16} + \frac{(3 \cdot 2)}{(8 \cdot 2)} = 10\frac{5}{16} + \frac{6}{16} = 10\frac{11}{16}$$

I multiplied the top and bottom numbers in $\frac{3}{8}$ by 2 so that both fractions would have a denominator of 16. Then I added my whole numbers and the numerators of the fractions.

More Comfortable Bike:

$$10\frac{5}{16} + 3\frac{1}{8} = 10\frac{5}{16} + 3\frac{(1 \cdot 2)}{(8 \cdot 2)} = 10\frac{5}{16} + 3\frac{2}{16} = 13\frac{7}{16}$$

I multiplied the top and bottom numbers in $\frac{1}{8}$ by 2 so that both fractions would have a denominator of 16. Then I added my whole numbers and the numerators of the fractions.

Question 3**RUBRIC**

Score	Description
4	Response demonstrates thorough understanding of using equivalent fractions to add and subtract fractions. <ul style="list-style-type: none">• Student finds a common denominator. (1 point)• Student clearly explains how fractions were converted to equivalent fractions and added or subtracted. (3 point)

SAMPLE RESPONSES**Faster Bike:**

$$18\frac{7}{8} - 11\frac{3}{4} = 18\frac{7}{8} - 11\frac{(3 \cdot 2)}{(4 \cdot 2)} = 18\frac{7}{8} - 11\frac{6}{8} = 7\frac{1}{8}$$

I multiplied the top and bottom numbers in $\frac{3}{4}$ by 2 so that both fractions would have a denominator of 8. Then I subtracted the whole numbers and the numerators of the fractions.

Freestyle Bike:

$$18\frac{7}{8} + 1\frac{1}{4} = 18\frac{7}{8} + 1\frac{(1 \cdot 2)}{(4 \cdot 2)} = 18\frac{7}{8} + 1\frac{2}{8} = 19\frac{9}{8} = 20\frac{1}{8}$$

I multiplied the top and bottom numbers in $\frac{1}{2}$ by 2 so that both fractions would have a denominator of 8. Then I added the whole numbers and the numerators of the fractions. Since I ended up with an improper fraction, I added one more variable and subtracted $\frac{8}{8}$ from $\frac{9}{8}$ to get $\frac{1}{8}$ left over.

More Comfortable Bike:

$$18\frac{7}{8} + 8\frac{7}{16} = 18\frac{7}{16} + 18\frac{(7 \cdot 2)}{(8 \cdot 2)} = 18\frac{14}{16} + 8\frac{7}{16} = 26\frac{21}{16} = 27\frac{5}{16}$$

I multiplied both numbers in $\frac{7}{8}$ by 2 so that both fractions would have a denominator of 16. Then I added the whole numbers and the numerators of the fractions. Since I ended up with an improper fraction, I added one more to the whole and subtracted $\frac{16}{16}$ from $\frac{21}{16}$, which left me with $\frac{5}{16}$.

Question 4**RUBRIC**

Score	Description
4	Response demonstrates thorough understanding of using equivalent fractions to add and subtract fractions. <ul style="list-style-type: none">• Student finds a common denominator. (1 point)• Student clearly explains how fractions were converted to equivalent fractions and added or subtracted. (3 point)

SAMPLE RESPONSES**Faster Bike:**

$$11\frac{7}{8} - 9\frac{1}{4} = 11\frac{7}{8} - 9\frac{(1 \cdot 2)}{(4 \cdot 2)} = 11\frac{7}{8} - 9\frac{2}{8} = 2\frac{5}{8}$$

I multiplied the top and bottom numbers in $\frac{1}{4}$ by 2 so that both fractions would have a denominator of 8. Then I subtracted my whole numbers and the numerators.

Freestyle Bike:

$$11\frac{7}{8} + 3\frac{1}{2} = 11\frac{7}{8} + 3\frac{(1 \cdot 4)}{(2 \cdot 4)} = 11\frac{7}{8} + 3\frac{4}{8} = 14\frac{11}{8} = 15\frac{3}{8}$$

I multiplied the top and bottom numbers in $\frac{1}{2}$ by 4 so that both fractions would have a denominator of 8. Then I added my whole numbers and the numerators of the fractions. Since I was left with an improper fraction, I added one more whole and subtracted $\frac{8}{8}$ from $\frac{11}{8}$ and was left with $\frac{3}{8}$.

More Comfortable Bike:

$$11\frac{7}{8} + 5\frac{3}{4} = 11\frac{7}{8} + 5\frac{(3 \cdot 2)}{(4 \cdot 2)} = 11\frac{7}{8} + 5\frac{6}{8} = 16\frac{13}{8} = 17\frac{5}{8}$$

I multiplied the top and bottom numbers in $\frac{3}{4}$ by 2 so that both fractions would have a denominator of 8. Then I added my whole numbers and the numerators of the fractions. Since I was left with an improper fraction, I added one more to the whole numbers and subtracted $\frac{8}{8}$ from $\frac{13}{8}$.

Question 5**RUBRIC**

Score	Description
3	Response demonstrates thorough understanding of using benchmark fractions and number sense to mentally estimate the sum of fractions. <ul style="list-style-type: none">• Student gives an estimate that is reasonable. (1 point)• Student clearly explains how fractions were converted to benchmark fractions and combined. (2 point)

SAMPLE RESPONSES**Faster Bike:**

I combined the whole numbers by using $27 + 20 = 47$. For the fractions, I know that $\frac{5}{16}$ is very close to $\frac{1}{4}$ and that $\frac{5}{8}$ is very close to $\frac{1}{2}$. I used $\frac{1}{4} + \frac{3}{4} + \frac{1}{2} + \frac{1}{4}$ and got $1\frac{3}{4}$. When I add that to my whole number of 47 I get a total of $48\frac{3}{4}$ for my estimate.

Freestyle Bike:

I combined the whole numbers and got 19 ($15 + 4$). For the fractions, I know that $\frac{3}{16}$ is close to $\frac{1}{4}$ and that $\frac{3}{8}$ is close to $\frac{1}{2}$. I used $\frac{1}{4} + \frac{1}{2} + \frac{3}{4} + \frac{1}{2}$ and got $1\frac{1}{2}$. When I add that to my whole number I get $20\frac{1}{2}$.

More Comfortable Bike:

I combined the whole numbers by grouping them first so I had $24 + 13 = 37$. For the fractions, I knew I could put the $\frac{3}{8}$ and the $\frac{1}{8}$ together to get $\frac{4}{8}$, which is the same as $\frac{1}{2}$. I know that $\frac{7}{16}$ is also very close to $\frac{1}{2}$. I used $\frac{1}{2} + \frac{1}{2} + \frac{3}{4}$ and got $1\frac{3}{4}$.

Question 6**RUBRIC**

Score	Description
2	Response demonstrates thorough understanding of using benchmark fractions and number sense to assess the reasonableness of answers. <ul style="list-style-type: none">• Student clearly explains whether or not the answer is reasonable. (2 points)

SAMPLE RESPONSE

$\frac{11}{45}$ is very close to $\frac{1}{4}$. $\frac{2}{9}$ is very close to $\frac{1}{3}$. Both of the benchmark fractions have one for the numerator, but a different number of pieces in the whole. If the whole has 4 pieces, each piece will be smaller than a whole with only 3 pieces. So, it is not reasonable to say that more people gave the bike four stars because $\frac{1}{4}$ is smaller than $\frac{1}{3}$.

Question 7**RUBRIC**

Score	Description
2	Response demonstrates thorough understanding of using benchmark fractions and number sense to assess the reasonableness of answers. <ul style="list-style-type: none">• Student clearly explains whether or not the answer is reasonable. (2 points)

SAMPLE RESPONSE

Yes, this is reasonable. $\frac{6}{15}$ is very close to $\frac{1}{2}$ and $\frac{3}{20}$ is nearly $\frac{1}{5}$. If you put $\frac{1}{2}$ and $\frac{1}{5}$ together you would have $\frac{7}{10}$. Since $\frac{1}{2}$ is the same as $\frac{5}{10}$, $\frac{7}{10}$ is over $\frac{1}{2}$.

Question 8**RUBRIC**

Score	Description
2	Response demonstrates thorough understanding of using benchmark fractions and number sense to assess the reasonableness of answers. <ul style="list-style-type: none">• Student clearly explains whether or not the answer is reasonable. (2 points)

SAMPLE RESPONSE

$\frac{7}{30}$ is very close to $\frac{1}{5}$. $\frac{6}{15}$ is very close to $\frac{1}{2}$. If we put $\frac{1}{2}$ and $\frac{1}{5}$ together, we would end up with less than $\frac{3}{4}$, because $\frac{3}{4}$ is $\frac{1}{2} + \frac{1}{4}$. So, it is not reasonable to say that over $\frac{3}{4}$ rated the bike three stars or more.

Question 9**RUBRIC****Part a.**

Score	Description
3	Response demonstrates thorough understanding of using benchmark fractions and number sense to mentally estimate the sum of fractions. <ul style="list-style-type: none">• Student gives an estimate that is reasonable. (1 point)• Student clearly explains how fractions were converted to benchmark fractions and combined. (2 point)

Part b.

Score	Description
4	Response demonstrates thorough understanding of converting measurement units. <ul style="list-style-type: none">• Student finds a common denominator. (1 point)• Student clearly explains how fractions were converted to equivalent fractions and added or subtracted. (2 point)• Student correctly identifies accuracy of work. (1 point)

SAMPLE RESPONSES**Part a.**

I know that $\frac{3}{7}$ is very close to $\frac{3}{8}$. If I add $\frac{3}{8}$ to the other fraction of $\frac{1}{8}$, I would have $\frac{4}{8}$, which is the same $\frac{1}{2}$. That means that approximately $\frac{1}{2}$ of the riders said they would "definitely" buy the bike.

Part b.

$$\frac{1}{8} + \frac{3}{7} = \frac{(1 \cdot 7)}{(8 \cdot 7)} + \frac{(3 \cdot 8)}{(7 \cdot 8)} = \frac{7}{56} + \frac{24}{56} = \frac{31}{56}$$

I multiplied the top and bottom number in $\frac{1}{8}$ by 7 and the top and bottom numbers in $\frac{3}{7}$ by 8. This way I ended up with two fractions with a denominator of 56. Then I added the numerators.

My estimate was $\frac{1}{2}$. $\frac{28}{56}$ is the same as $\frac{1}{2}$ and the exact answer is $\frac{31}{56}$, so my estimate was very reasonable.