

## Journal Entry Topic: Adding and subtracting fractions

### Important points:

The fractions must have common denominators (the bottom number) to be able to add or subtract them

If the fractions already have the same denominator, you just add or subtract them,

$$\text{e.g. } \frac{6}{7} - \frac{4}{7} = \frac{2}{7}$$

The common denominator stays the same since it represents the number of parts to a whole

To get a common denominator list the multiples of the denominators for the fractions you are adding or subtracting

$$\text{e.g. } \frac{2}{3} + \frac{4}{5}$$

### Denominator multiples:

Multiples of 3: 3, 6, 9, 12, 15, 18, 21...

Multiples of 5: 5, 10, 15, 20, 25 ...

The first multiple that appears in both lists is 15. 15 is called the least common multiple (LCM), so we can use 15 as the common denominator.

Multiply the top and bottom of each fraction by whatever number makes the denominator the LCM

$$\text{In this case multiply } \frac{2}{3} \text{ by 5: } \frac{2 \times 5}{3 \times 5} = \frac{10}{15}$$

$$\text{In this case multiply } \frac{4}{5} \text{ by 3: } \frac{4 \times 3}{5 \times 3} = \frac{12}{15}$$

To add the fractions, add the numerators (top numbers) and keep the denominator the same.

$$\frac{10}{15} + \frac{12}{15} = \frac{22}{15}$$

### Real World Application

Shari wants to make a laminated canoe paddle.



Three of the strips of wood that she will use to make a pin stripe are  $\frac{1}{4}$ ",  $\frac{7}{16}$ ", and  $\frac{1}{4}$ ". How wide will the pin stripe be?

I have to find a common denominator before I add the fractions. Here is my calculation:

$$\begin{aligned} & \frac{1}{4} + \frac{7}{16} + \frac{1}{4} \\ & \text{FIND A COMMON DENOMINATOR} \\ & = \frac{1 \times 4}{4 \times 4} + \frac{7}{16} + \frac{1 \times 4}{4 \times 4} \\ & = \frac{4}{16} + \frac{7}{16} + \frac{4}{16} \\ & = \frac{15}{16} \end{aligned}$$

The pin stripe will be  $\frac{15}{16}$ " wide.

Overall Level: 4 (most consistent)

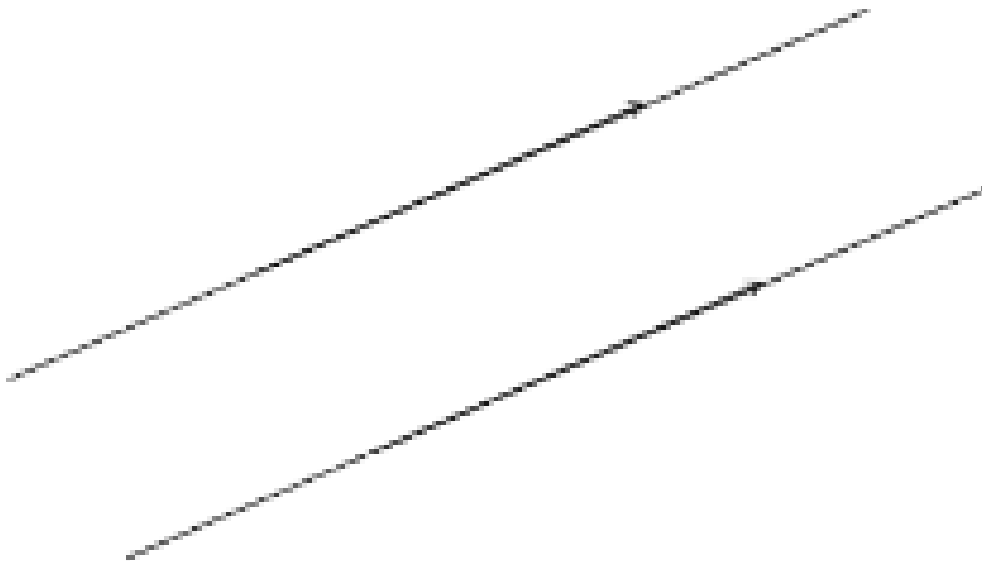
<b>Rubric for the MFM2P Math Journals</b>				
Categories	Level 4 (80 – 100%)	Level 3 (70 – 79%)	Level 2 (60 – 69%)	Level 1 (50 – 59%)
Knowledge and Understanding [5 marks]	Demonstrates knowledge of relevant and appropriate skills and procedures with a high degree of effectiveness.	Demonstrates knowledge of relevant and appropriate skills and procedures with considerable effectiveness.	Demonstrates knowledge of relevant and appropriate skills and procedures with some effectiveness.	Demonstrates knowledge of relevant and appropriate skills and procedures with limited effectiveness.
	Illustrates an understanding of the meaning of the mathematical content with a high degree of effectiveness.	Illustrates an understanding of the meaning of the mathematical content with considerable effectiveness.	Illustrates an understanding of the meaning of the mathematical content with some effectiveness.	Illustrates an understanding of the meaning of the mathematical content with limited effectiveness.
<p>Level 4</p> <p>The following have been demonstrated to a high degree:</p> <p>The explanation of adding fractions is clear and correct and would be useful as review or for someone who doesn't understand the process.</p>				
Thinking [5 marks]	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with a high degree of effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with considerable effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with some effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with limited effectiveness.
	Demonstrates a logical interpretation of problem with a high degree of effectiveness.	Demonstrates a logical interpretation of problem with considerable effectiveness.	Demonstrates a logical interpretation of problem with some effectiveness.	Demonstrates a logical interpretation of problem with limited effectiveness.

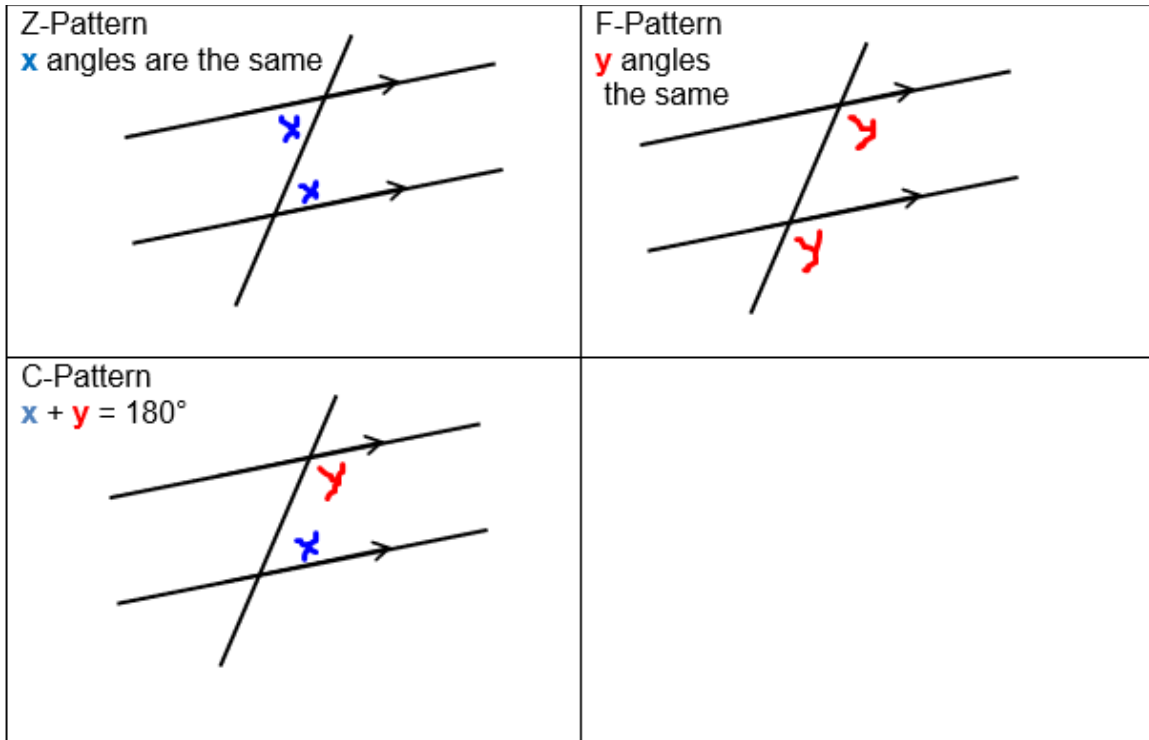
<p>Level 3</p> <p>The following have been demonstrated to a considerable degree:</p> <p>The problem is somewhat narrow in scope, but it has been interpreted correctly. The conclusion is fully justified by calculation.</p> <p>This could be strengthened using a diagram that shows why <math>\frac{1}{4}</math> and <math>\frac{4}{16}</math> are equivalent.</p>				
Application [5 marks]	Illustrates relevant and appropriate selection of facts, skills and procedures with a high degree of effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with considerable effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with some effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with limited effectiveness.
	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with a high degree of effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with considerable effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with some effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with limited effectiveness.
<p>Level 4</p> <p>The following have been demonstrated to a high degree:</p> <p>The correct mathematical process (adding fractions) is selected.</p> <p>The calculation requires finding a common denominator and so involves the concept of the lowest common multiple.</p> <p>Adding thin pieces of wood to make a lamination is an appropriate application of adding fractions.</p>				
Communication [5 marks]	Uses math vocabulary, notation and symbols with a high degree of accuracy.	Uses math vocabulary, notation and symbols with a considerable accuracy.	Uses math vocabulary, notation and symbols with some accuracy.	Uses math vocabulary, notation and symbols with limited accuracy.
	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with a high degree of effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with considerable effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with some effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with limited effectiveness.

Communication [5 marks]	Expresses a reflection on mathematical thinking with a high degree of clarity.	Expresses a reflection on mathematical thinking with considerable clarity.	Expresses a reflection on mathematical thinking with some clarity.	Expresses a reflection on mathematical thinking with limited clarity.
<p>Level 4</p> <p>The following have been demonstrated to a high degree:</p> <p>Mathematical vocabulary is used correctly.</p> <p>Correct form is demonstrated in the calculation</p> <p>Math notation is used appropriately.</p> <p>Calculations are well organized, clear and complete</p>				

#### Journal Entry Topic: Parallel Lines Properties

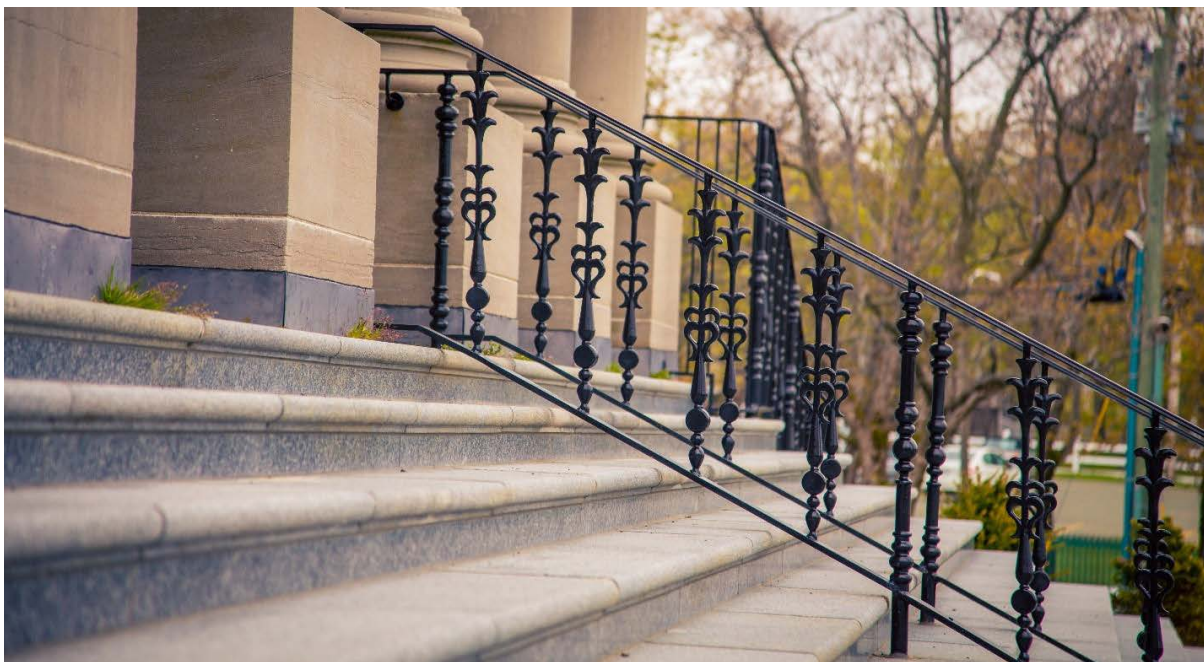
- The symbol for parallel on a diagram is arrows:
- The arrows tell us these lines are parallel.





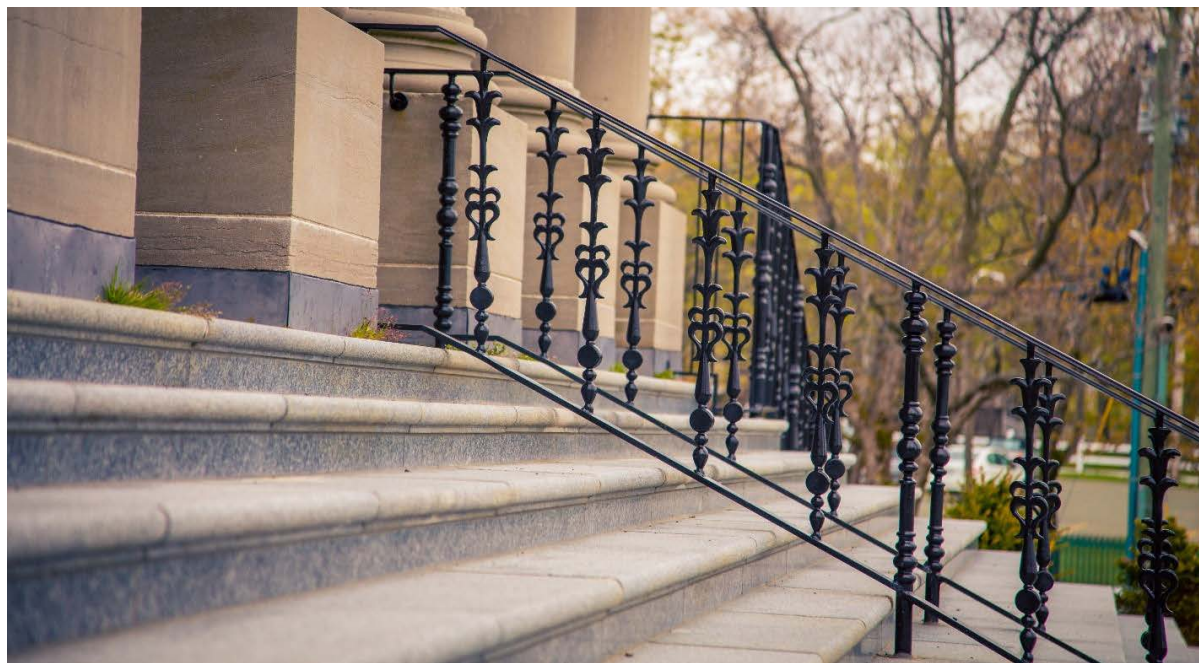
**Real World Application**

Andy wants to rebuild a wrought iron railing. He knows that the angles are not standard because the stair case is very old and does not conform to current guidelines.



He uses graphing software to determine the angle between the uprights and the rails and finds it is approximately  $62^\circ$

He uses the C pattern to determine the angle at which the uprights meet the top rail, as shown.



### Overall Level: 3 (most consistent)

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	Illustrates an understanding of the meaning of the mathematical content with a high degree of effectiveness.	Illustrates an understanding of the meaning of the mathematical content with considerable effectiveness.	Illustrates an understanding of the meaning of the mathematical content with some effectiveness.	Illustrates an understanding of the meaning of the mathematical content with limited effectiveness.



<p>Level 3.</p> <p>The three Z, F and C pattern rules are correct but they lack detail to explain the patterns in depth (i.e where is the F, Z &amp; C)?</p> <p>They are mathematically correct.</p>				
Thinking [5 marks]	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with a high degree of effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with considerable effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with some effectiveness.	Shows evidence of modelling the problem, drawing conclusions, or justifying reasoning with limited effectiveness.
	Demonstrates a logical interpretation of problem with a high degree of effectiveness.	Demonstrates a logical interpretation of problem with considerable effectiveness.	Demonstrates a logical interpretation of problem with some effectiveness.	Demonstrates a logical interpretation of problem with limited effectiveness.
<p>Level 3</p> <p>The following has been demonstrated to a considerable degree:</p> <p>The problem is somewhat clear but some additional detail would improve what Andy needs to know to rebuild this railing.</p>				
Application [5 marks]	Illustrates relevant and appropriate selection of facts, skills and procedures with a high degree of effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with considerable effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with some effectiveness.	Illustrates relevant and appropriate selection of facts, skills and procedures with limited effectiveness.
	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with a high degree of effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with considerable effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with some effectiveness.	Demonstrates relevant and appropriate connections made between math concepts and the world outside the classroom with limited effectiveness.

<p>Level 4</p> <p>The following have been demonstrated to a high degree:</p> <p>The application aligns well with parallel lines patterns.</p> <p>The application relates well to a real-world context.</p> <p>The diagram is clear and the math applied correctly.</p>				
Communication [5 marks]	Uses math vocabulary, notation and symbols with a high degree of accuracy.	Uses math vocabulary, notation and symbols with a considerable accuracy.	Uses math vocabulary, notation and symbols with some accuracy.	Uses math vocabulary, notation and symbols with limited accuracy.
	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with a high degree of effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with considerable effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with some effectiveness.	Writes algebraic solutions, graphs, charts and diagrams clearly written and organized with limited effectiveness.
	Expresses a reflection on mathematical thinking with a high degree of clarity.	Expresses a reflection on mathematical thinking with considerable clarity.	Expresses a reflection on mathematical thinking with some clarity.	Expresses a reflection on mathematical thinking with limited clarity.
<p>Level 3:</p> <p>The following has been demonstrated to a considerable degree:</p> <p>The math vocabulary is used correctly</p> <p>Math notation is used correctly</p> <p>The graph is clear and complete</p> <p>Mathematical thinking has been shown.</p>				