

A2 5.4: I can apply the properties of rational numbers to rational functions (addition/subtraction)

$$\text{ex } \frac{3x-1}{x+1} + \frac{2}{3x+1}$$

① check for domain restrictions!

$$\frac{3x-1}{x+1} + \frac{2}{3x+1}$$

$x \neq -1$        $x \neq -\frac{1}{3}$

② multiply each fraction by a clever form of 1 to get a common denominator

$$\frac{3x+1}{3x+1} \cdot \frac{3x-1}{x+1} + \frac{2}{3x+1} \cdot \frac{x+1}{x+1}$$

$$= \frac{3x^2-1}{3x^2+4x+1} + \frac{2x+2}{3x^2+4x+1}$$

③ Add! Combine like terms. Don't forget to indicate domain restrictions.

$$\frac{3x^2+4x+1}{3x^2+4x+1}$$

$x \neq -1$   
 $x \neq -\frac{1}{3}$

A2 5.4: I can apply the properties of rational numbers to rational functions  
(division edition)

$$\underline{\text{ex}} \quad \frac{(X+2)(X+3)}{(X-4)} \div \frac{(X-5)(X+1)}{(X-4)}$$

① check for domain restrictions!

$$\frac{(X+2)(X+3)}{(X-4)} \div \frac{(X-5)(X+1)}{(X-4)}$$

$X \neq$                        $X \neq$

② multiply by reciprocal + check for new domain restrictions!

$$\frac{(X+2)(X+3)}{(X-4)} \cdot \frac{(X-4)}{(X-5)(X+1)}$$

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Annotations:  
 - "keep" points to the first fraction.  
 - "change" points to the multiplication dot.  
 - "flip" points to the reciprocal fraction.  
 - "old restriction" points to  $X \neq$  below the reciprocal fraction.  
 - "new restriction" points to  $X \neq$  below the result line.