

Outcome 2 - Adding & Subtracting Algebraic Fractions

Bronze examples

Examples... You can add or subtract fractions if...
...they have the SAME denominator!

$$\frac{2}{a} + \frac{7}{a} = \frac{9}{a} \quad \bullet \text{ Add the numerators!}$$

$$\frac{5}{d} - \frac{3}{d} = \frac{2}{d} \quad \bullet \text{ Subtract the numerators!}$$

$$\frac{l}{n} + \frac{m}{n} = \frac{l+m}{n}$$

Silver examples

Examples...

- Multiply denominators!
- Cross multiply!
- Add/subtract the numerators!
- Simplify! (if required)

$$\frac{2}{a} \times \frac{7}{b} = \frac{2b}{ab} + \frac{7a}{ab} = \frac{2b+7a}{ab}$$

$$\frac{c}{2} \times \frac{d}{3} = \frac{6c}{12} + \frac{2d}{12} = \frac{6c+2d}{12} = \frac{3c+d}{6}$$

$$\frac{6}{w} \times \frac{4}{w^2} = \frac{6w^2}{w^3} + \frac{4w}{w^3} = \frac{6w^2+4w}{w^3} = \frac{6w+4}{w^2}$$

Gold examples

Examples...

- Multiply denominators!
- Cross multiply!
- Add/subtract the numerators!
- Simplify! (if required)

$$\frac{3}{(x+1)} \times \frac{5}{(x-4)} = \frac{3x-12}{(x+1)(x-4)} + \frac{5x+5}{(x+1)(x-4)}$$

$$= \frac{8x-7}{(x+1)(x-4)}$$

Bronze Questions

Add or subtract the following fractions...



 $\frac{4}{b} + \frac{3}{b}$	 $\frac{8}{p} - \frac{4}{p}$
 $\frac{5}{y} + \frac{6}{y}$	 $\frac{7}{t} - \frac{5}{t}$
 $\frac{e}{g} + \frac{f}{g}$	 $\frac{w}{y} - \frac{x}{y}$
 $\frac{p}{q} + \frac{5}{q}$	 $\frac{6}{t} - \frac{s}{t}$

Silver Questions

Add or subtract the following fractions...



 $\frac{1}{m} + \frac{8}{n}$	 $\frac{7}{p} - \frac{1}{r}$
 $\frac{3}{g} + \frac{f}{7}$	 $\frac{s}{10} - \frac{6}{t}$
 $\frac{t}{7} + \frac{v}{2}$	 $\frac{s}{2} - \frac{t}{10}$
 $\frac{2}{u^2} + \frac{5}{u}$	 $\frac{6}{b} - \frac{4}{b^2}$

Gold Questions

Add or subtract the following fractions...



 $\frac{7}{(x+1)} + \frac{2}{(x+5)}$	 $\frac{5}{(x+3)} + \frac{3}{(x+7)}$
 $\frac{6}{(x+2)} - \frac{1}{(x-4)}$	 $\frac{8}{(x+5)} + \frac{4}{(x-3)}$
 $\frac{7}{(x+4)} + \frac{2}{(x-9)}$	 $\frac{11}{(x-2)} + \frac{6}{(x-1)}$
 $\frac{3}{(x-1)} - \frac{5}{(x+4)}$	 $\frac{5}{(x+3)} - \frac{6}{(x-7)}$

Bronze Answers

- | | |
|--------------|--------------|
| 1. $7/b$ | 2. $4/p$ |
| 3. $11/y$ | 4. $2/t$ |
| 5. $e + f/g$ | 6. $w - x/y$ |
| 7. $p + 5/q$ | 8. $6 - s/t$ |

Silver Answers

- | | |
|-----------------|------------------|
| 1. $n + 8m/mn$ | 2. $7r - p/pr$ |
| 3. $21 + gf/7g$ | 4. $st - 60/10t$ |
| 5. $2t + 7v/14$ | 6. $5s - t/10$ |
| 7. $2 + 5u/u^2$ | 8. $6b - 4/b^2$ |

Gold Answers

- | | |
|------------------------------|------------------------------|
| 1. $9x + 37/(x + 1)(x + 5)$ | 2. $8x + 44/(x + 3)(x + 7)$ |
| 3. $5x - 26/(x + 2)(x - 4)$ | 4. $12x - 4/(x + 5)(x - 3)$ |
| 5. $9x - 55/(x + 4)(x - 9)$ | 6. $17x - 23/(x - 2)(x - 1)$ |
| 7. $-2x + 17/(x - 1)(x + 4)$ | 8. $-x - 53/(x + 3)(x - 7)$ |