

October 24, 2001

## ALL Factoring $\rightarrow$ Rationals

### Factor

$$\begin{aligned} & 6x^2 + 11x + 3 \\ &= 6x^2 + 9x + 2x + 3 \\ &= 3x(2x+3) + 1(2x+3) \\ &= (3x+1)(2x+3) \end{aligned}$$

$$\begin{aligned} & 9s^2 - 144y^2 \\ &= 9(s^2 - 16y^2) \\ &= 9(s+4y)(s-4y) \end{aligned}$$

$$\begin{aligned} & 9s^2 - 144y^2 \\ &= (3s+12y)(3s-12y) \\ &= 3(s+4y) \cdot 3(s-4y) \\ &= 9(s+4y)(s-4y) \end{aligned}$$

### Simplify

$$\begin{aligned} 1) \quad & \frac{x+7}{x^2+8x+7} = \frac{x+7}{(x+1)(x+7)} \\ &= \frac{1}{x+1} \end{aligned}$$

$$\begin{aligned} 2) \quad & \frac{y^2-1}{y^2-2y+1} = \frac{(y+1)(y-1)}{(y-1)(y-1)} \\ &= \frac{y+1}{y-1} \end{aligned}$$

$$\begin{aligned} 3) \quad & \frac{x^2+6x+5}{x^2+2x+1} = \frac{(x+1)(x+5)}{(x+1)(x+1)} \\ &= \frac{x+5}{x+1} \end{aligned}$$



October 25, 2007

## Rationals

Simplify

$$\textcircled{1} \frac{4x^2 + 10x + 4}{4x^2 - 16}$$

$$\begin{aligned} & 4x^2 + 10x + 4 \\ &= 2(2x^2 + 5x + 2) \\ &= 2(2x+1)(x+2) \end{aligned}$$

$$\begin{aligned} & 4x^2 - 16 \\ &= 4(x^2 - 4) \\ &= 4(x-2)(x+2) \end{aligned}$$

$$\therefore \frac{2(2x+1)(x+2)}{4(x-2)(x+2)} = \frac{2x+1}{2(x-2)}$$

$$\textcircled{2} \frac{2x^2 - 9xy + 10y^2}{4x^2 - 20xy + 24y^2}$$

$$\begin{aligned} & 2x^2 - 9xy + 10y^2 \\ &= (x-2y)(2x-5y) \end{aligned}$$

$$\begin{aligned} & 4x^2 - 20xy + 24y^2 \\ &= 4(x^2 - 5xy + 6y^2) \\ &= 4(x-2y)(x-3y) \end{aligned}$$

$$\therefore \frac{(x-2y)(2x-5y)}{4(x-2y)(x-3y)}$$

$$= \frac{2x-5y}{4(x-3y)}$$

