

Section 1.3 - Factor

$$\begin{aligned} \#28 \quad 8x^2 - 14x + 3 &= (\underline{\quad} - 1)(\underline{\quad} - 3) \quad (3 \text{ is prime, both } "-") \\ &= \boxed{(4x-1)(2x-3)} \end{aligned}$$

$$\begin{aligned} \#46 \quad 8k^2 - 16k - 10 &= 2(4k^2 - 8k - 5) \\ &= \boxed{2(2k+1)(2k-5)} \end{aligned}$$

$$\begin{aligned} \#70 \quad 125p^3 + 8q^3 \\ \text{recall } a^3 + b^3 &= (a+b)(a^2 - ab + b^2) \\ \text{here } a &= 5p \text{ and } b = 2q \\ 125p^3 + 8q^3 &= (5p+2q)(25p^2 - 5p \cdot 2q + 4q^2) \\ &= \boxed{(5p+2q)(25p^2 - 10pq + 4q^2)} \end{aligned}$$

$$\begin{aligned} \#72 \quad y^4 + 7y^2 + 10 &= (y^2 + \underline{\quad})(y^2 + \underline{\quad}) \\ &= \boxed{(y^2 + 2)(y^2 + 5)} \end{aligned}$$

Section 1.4 perform the operations and simplify

$$\#12 \quad \frac{r^2 - r - 6}{r^2 + r - 12} = \frac{(r-3)(r+2)}{(r-3)(r+4)} = \boxed{\frac{r+2}{r+4}}$$

$$\begin{aligned} \#28 \quad \frac{n^2 - n - 6}{n^2 - 2n - 8} \div \frac{n^2 - 9}{n^2 + 7n + 12} &= \frac{n^2 - n - 6}{n^2 - 2n - 8} \cdot \frac{n^2 + 7n + 12}{n^2 - 9} \\ &= \frac{(n-3)\cancel{(n+2)}}{(n-4)\cancel{(n+2)}} \cdot \frac{\cancel{(n+3)}(n+4)}{(n-3)\cancel{(n+3)}} = \boxed{\frac{n+4}{n-4}} \end{aligned}$$

$$\#38 \quad \frac{8}{y+2} - \frac{3}{y} = \frac{8}{y+2} \cdot \frac{y}{y} - \frac{3}{y} \cdot \frac{y+2}{y+2}$$

$$= \frac{8y}{y(y+2)} - \frac{3y+6}{y(y+2)} = \frac{8y-3y-6}{y(y+2)} = \boxed{\frac{5y-6}{y(y+2)}}$$

$$\#44 \quad \frac{3}{m^2-3m-10} + \frac{7}{m^2-m-20} = \frac{3}{(m-5)(m+2)} + \frac{7}{(m-5)(m+4)}$$

$$\text{LCD } (m+2)(m+4)(m-5)$$

$$= \frac{3(m+4)}{(m-5)(m+2)(m+4)} + \frac{7(m+2)}{(m-5)(m+4)(m+2)}$$

$$= \frac{3m+12+7m+14}{(m-5)(m+2)(m+4)} = \boxed{\frac{10m+26}{(m-5)(m+2)(m+3)}}$$

$$= \boxed{\frac{2(5m+13)}{(m-5)(m+2)(m+3)}}$$