3.2 Extension: Factoring Expressions p.92

- When factoring an expression, you write the expression as a product of factors.
- You can use the distributive property to factor expressions (it's using the distributive property in reverse which means you DIVIDE.)
- $3(x + 4) = 3x + 12$ → you multiply to simplify (distributive property)
- $\frac{3x}{3} + \frac{12}{3} = 3(x + 4)$ → you divide to factor

Part 1: Factor out the GCF (greatest common factor)

a) $\frac{8}{8} + \frac{24}{8} =$ $8(1 + 3)$

b) $\frac{24x}{6} - \frac{18}{6} =$ $6(4x - 3)$

c) $\frac{-4p}{2} + \frac{10}{2} =$ $2(-2p + 5)$

Part 2: Factor out the coefficient of the variable (# in front of variable)

a) $\frac{\frac{1}{4}b}{\frac{1}{4}} - \frac{\frac{1}{4}}{\frac{1}{4}} =$ $\frac{1}{4}(b - 1)$

copy - switch - flip

$\frac{3}{2} \div \frac{1}{2} \rightarrow \frac{3}{2_1} \cdot \frac{2^1}{1} = 3$

b) $\frac{\frac{1}{2}x}{\frac{1}{2}} + \frac{\frac{3}{2}}{\frac{1}{2}} =$ $\frac{1}{2}(x + 3)$

c) $\frac{\frac{1}{8}f}{\frac{1}{8}} + \frac{\frac{1}{4}}{\frac{1}{8}} =$ $\frac{1}{8}(f + 2)$

$\frac{1}{4} \div \frac{1}{8} \rightarrow \frac{1}{4_1} \cdot \frac{8^2}{1} = 2$

d) $\frac{3.3y}{3.3} + \frac{6.6}{3.3} =$ $3.3(y + 2)$

e) $\frac{2.4n}{2.4} + \frac{9.6}{2.4} =$ $= 2.4(n + 4)$

Part 3: Factor out a specific number

a) Factor -4 out of $\frac{-16g}{-4} + \frac{20}{-4} =$ $-4(4g - 5)$

b) Factor $-\frac{1}{3}$ out of $\frac{-\frac{1}{3}x}{-\frac{1}{3}} + \frac{6}{-\frac{1}{3}} =$ $-\frac{1}{3}(x - 18)$

$\frac{6}{1} \div \frac{1}{3} \rightarrow \frac{6}{1} \cdot \frac{3}{1} = 18$

c) Factor $-\frac{1}{8}$ out of $\frac{-\frac{1}{4}x}{-\frac{1}{8}} - \frac{\frac{3}{8}}{-\frac{1}{8}} =$ $-\frac{1}{8}(2x + 3)$

$\frac{1}{4} \div \frac{1}{8} \rightarrow \frac{1}{4_1} \cdot \frac{8^2}{1} = 2$

$\frac{3}{8} \div \frac{1}{8} \rightarrow \frac{3}{8_1} \cdot \frac{8}{1} = 3$