Divide f(x) by d(x) by using long division, and write a summary statement in polynomial form and fraction form.

$f(x) = 3x^3 + 5x^2 + 8x + 7 \quad d(x) = 3x + 2$

$$(p^3 - 10p^2 + 20p + 26) \div (p - 5)$$

$$(x^2 - 74) \div (x - 8)$$

Divide f(x) by d(x) by using synthetic division, and write a summary statement in polynomial form and fraction form.

$f(x) = 3x^3 + 5x^2 + 8x + 7$ $d(x) = 3x + 2$

$$-\frac{2}{3} \begin{array}{|cccc} 3 & 5 & 8 & 7 \\ & -2 & -2 & -4 \\ \hline 3 & 3 & 6 & 3 \end{array}$$

$$\boxed{1 \quad 1 \quad 2}$$

$X^2 + X + 2 + \dfrac{3}{3X+2}$

$f(x) = x^2 + 5x + 6$ $d(x) = x + 2$

$$-2 \begin{array}{|ccc} 1 & 5 & 6 \\ & -2 & -6 \\ \hline 1 & 3 & 0 \end{array}$$

$X + 3$

$(r^2 + 6r + 15) \div (r + 5)$

$$-5 \begin{array}{|ccc} 1 & 6 & 15 \\ & -5 & -5 \\ \hline 1 & 1 & 10 \end{array}$$

$r + 1 + \dfrac{10}{r+5}$

$3r^2 + 11r - 6 \quad -18$ $f(6)$

$$6 \begin{array}{|cccc} 3 & 11 & -6 & -18 \\ & 18 & 174 & 1008 \\ \hline 3 & 29 & 168 & 990 \end{array}$$

$(3r^3 + 11r^2 - 6r - 18) \div \boxed{(r + 4)}$

$$-4 \begin{array}{|cccc} 3 & 11 & -6 & -18 \\ & -12 & 4 & 8 \\ \hline 3 & -1 & -2 & -10 \end{array}$$

$3r^2 - r - 2 + \dfrac{10}{r+4}$

$$m^3 + 0m^2 + 0m - 20$$

$$10x = 8$$

$(m^3 - 20) \div (m - 3)$

$$
\begin{array}{r|rrrr}
3 & 1 & 0 & 0 & -20 \\
  &   & 3 & 9 & 27 \\
\hline
  & 1 & 3 & 9 & \boxed{7}
\end{array}
$$

$$m^2 + 3m + 9 + \frac{7}{m-3}$$

Determine whether the first polynomial is a factor of the second polynomial.

A) x- 2; x³ − 4x² + 8x − 8

$$
\begin{array}{r|rrrr}
2 & 1 & -4 & 8 & -8 \\
  &   & 2 & -4 & 8 \\
\hline
  & 1 & -2 & 4 & \boxed{0}
\end{array}
$$

Yes x-2 is a factor

B) x + 3; x³ + 2x² - 4x − 2

$$
\begin{array}{r|rrrr}
-3 & 1 & 2 & -4 & -2 \\
   &   & -3 & 3 & 3 \\
\hline
   & 1 & -1 & -1 & \boxed{1}
\end{array}
$$

No x+3 is not a factor