	$(x^6 - 5x^5 + 3x^4 + 7x^3 - 6x^2 + 2x - 8)(x^2 + 7x + 12)$
	Divide f(x) by d(x) using long division. Write a summary statement in polynomial form and factored form. $f(x) = x^2 + 5x + 6$ $d(x) = x + 2$ $x+3$ $x+2 \overline{)\ x^2+5x+6}$ $-\ x^2+2x$ $3x+6$ $-\ 3x+6$ 0 $x+3$

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

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

$$3x+2 \overline{)\, 3x^3+5x^2+8x+7}$$

X^2+X+2

$-(3x^3+2x^2)$

$3x^2+8x$

$-(3x^2+2x)$

$6x+7$

$-(6x+4)$

3

$X^2+X+2+\frac{3}{3x+2}$

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

$$p-5 \overline{)\, p^3-10p^2+20p+26}$$

p^2-5p-5

$-(p^3-5p^2)$

$-5p^2+20p$

$-(-5p^2+25p)$

$-5p+26$

$-(-5p+25)$

1

$p^2-5p-5+\frac{1}{p-5}$

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

$$x-8 \overline{)\, x^2+0x-74}$$

$X+8$

$-(x^2-8x)$

$8x-74$

$-(8x-64)$

-10

$X+8+\frac{-10}{X-8}$

$X+8-\frac{10}{X-8}$

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

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

Synthetic Division use coefficients and zero.

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

$x+2=0$

$x=-2$

$$\begin{array}{r|rrr} -2 & 1 & 5 & 6 \\ & & -2 & -6 \\ \hline & 1 & 3 & 0 \end{array}$$ ← Remainder

$x+3$

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

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

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

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

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

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

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

$1 \quad -20$	$(m^3-20)\div(m-3)$

$$3 \mid 1 \quad 0 \quad 0 \quad -20$$
$$\quad\quad 3 \quad 9 \quad 27$$
$$1 \quad 3 \quad 9 \mid \boxed{7}$$

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

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

A) $x-2;\ x^3-4x^2+8x-8$

Yes $x-2$ is a factor

$$x-2 \overline{)\ x^3-4x^2+8x-8}$$
$$x^2-2x+4$$
$$-(x^3-2x^2)$$
$$-2x^2+8x$$
$$-(-2x^2+4x)$$
$$4x-8$$
$$-(4x-8)$$
$$0$$

B) $x+3;\ x^3+2x^2-4x-2$

$$-3 \mid 1 \quad 2 \quad -4 \quad -2$$
$$\quad\quad -3 \quad 3 \quad 3$$
$$1 \quad -1 \quad -1 \mid 1$$

No $x+3$ is not a factor