Questions From Homework

① h) $3x^4+7x^3+2x^2$

$x^2(3x^2+7x+2)$ Trinomial Decomposition

$x^2((3x^2+6x)(+x+2))$

$x^2(3x(x+2)+1(x+2))$

$x^2(3x+1)(x+2)$

② d) y^3-9y

$y(y^2-9)$ Difference of Squares

$y(y+3)(y-3)$

② f) x^6+8

$(x^2+2)(x^4-2x^2+4)$

② h) r^8-1

$(r^4+1)(r^4-1)$

$(r^4+1)(r^2+1)(r^2-1)$

$(r^4+1)(r^2+1)(r+1)(r-1)$

③ a) $(x^3 - x^2 - 16x + 16)$

$x^2(x-1) - 16(x-1)$

$(x-1)(x^2-16)$

$(x-1)(x-4)(x+4)$

b) $x^3 - 7x + 6$ or $x^3 + 0x^2 - 7x + 6$

$(1)^3 - 7(1) + 6$

$1 - 7 + 6$

0

$(x-1)$ is a factor

$$
\begin{array}{r|l}
x^2 + x - 6 & \\
x-1 \;\overline{)\; x^3 + 0x^2 - 7x + 6} & (x-1)(x^2+x-6) \\
-(x^3 - x^2) \downarrow & \\
\hline
x^2 - 7x & \\
-(x^2 - x) \downarrow & \\
\hline
-6x + 6 & \\
-(-6x + 6) & \\
\hline
0 & (x-1)(x+3)(x-2)
\end{array}
$$

Synthetic Substitution

Factor using synthetic substitution $x^3 - 7x^2 - 4x + 28$

$(2)^3 - 7(2)^2 - 4(2) + 28$

$8 - 28 - 8 + 28$

0

Find a value of x that makes it equal 0

(x-value) **(Coefficients of the polynomial)**

2 | 1 -7 -4 28

1) Bring down the first coefficient

1			

(x-value) **(Coefficients of the polynomial)**

2 | 1 -7 -4 28

2) Multiply the first coefficient by the *x-value* and place under the second coefficient. ADD.

	2		
1	-5		

(x-value) **(Coefficients of the polynomial)**

2 | 1 -7 -4 28

3) Repeat the steps. The coefficients of the other factor are in the bottom row.

	2	-10	-28
1	-5	-14	0

$(x-2)(x^2-5x-14)$

$(x-2)(x+2)(x-7)$

$x^3 + 5x^2 - 2x - 24$ **Find a value of x that makes it equal 0**

$(2)^3 + 5(2)^2 - 2(2) - 24$

$8 + 20 - 4 - 24$

0

(x-value) **(Coefficients of the polynomial)**

2

1	5	-2	-24
	2	14	24
1	7	12	0

$(x-2)(x^2+7x+12)$

$(x-2)(x+3)(x+4)$

Homework

㉟ $(x+2)$ is a factor of x^3+2x^2+kx+6

$(-2)^3+2(-2)^2+k(-2)+6=0$