

Questions From Homework

① h) $3x^4 + 7x^3 + 2x^2$
 $x^2 (3x^2 + 7x + 2)$ ← Trinomial Decomposition
 $x^2 (3x^2 + 6x + 1x + 2)$ $\frac{6}{x} \frac{1}{-} = 6$
 $\frac{6}{+} \frac{1}{-} = 7$
 $x^2 [3x(x+2) + 1(x+2)]$
 $x^2 (x+2)(3x+1)$

② g) $x^4 - 16$ ← Difference of Squares
 $(x^2 + 4)(x^2 - 4)$
 $(x^2 + 4)(x+2)(x-2)$

③ e) $4x^3 + 12x^2 + 5x - 6$ ← Factor Theorem
 $4(-2)^3 + 12(-2)^2 + 5(-2) - 6$ $(x+2)$ is a factor
 $-32 + 48 - 10 - 6$
 0

Trinomial Decomp
↓

$$\begin{array}{r} \underline{\underline{x+2}} \overline{4x^3 + 12x^2 + 5x - 6} \\ \underline{-(4x^3 + 8x^2)} \quad \downarrow \\ \quad \underline{4x^2 + 5x} \\ \quad \underline{-(4x^2 + 8x)} \quad \downarrow \\ \quad \quad \underline{-3x - 6} \\ \quad \quad \underline{-(-3x - 6)} \\ \quad \quad \quad 0 \end{array}$$

$(x+2)(4x^2 + 4x - 3)$
 $(x+2)(4x^2 - 2x)(2x - 3)$
 $(x+2)[2x(2x-1) + 3(2x-1)]$
 $(x+2)(2x-1)(2x+3)$

Questions From Homework

$$\textcircled{4} \text{ a) } x^{5/2} - x^{1/2}$$

$$x^{1/2} (x^{4/2} - x^0)$$

$$x^{1/2} (\underline{x^2} - \underline{1}) \leftarrow \text{Difference of Squares}$$

$$x^{1/2} (\underline{x+1})(\underline{x-1})$$

$$\text{b) } x + 5x^0 + 6x^{-1}$$

$$x^{-1} (x^2 + 5x + 6x^0)$$

$$x^{-1} (x^2 + 5x + 6)$$

Synthetic Substitution

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

$(x-2)$ is a factor

Find a value of x that makes it equal 0

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

$$8 - 28 - 8 + 28 = 0$$

(x-value)

2

(Coefficients of the polynomial)

1 -7 -4 28

1

Bring down the first coefficient

(x-value)

2

(Coefficients of the polynomial)

1 -7 -4 28

2

1 -5

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

(x-value)

2

(Coefficients of the polynomial)

1 -7 -4 28

2 -10 -28

1 -5 -14 0

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

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

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

← Simple Trinomial

$$-7 \times 2 = -14$$

$$-7 + 2 = -5$$

$$x^3 + 5x^2 - 2x - 24$$

Find a value of x that makes it equal 0

$$\begin{aligned} (2)^3 + 5(2)^2 - 2(2) - 24 \\ 8 + 20 - 4 - 24 = 0 \end{aligned}$$

$(x-2)$ is a factor.

(x-value)

2 |



(Coefficients of the polynomial)

1	5	-2	-24
	2	14	24
<hr/>			
1	7	12	0



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

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

← Simple Trinomial

Homework

③ a)

$$\begin{array}{r} \underline{x-2} \overline{) x^3 - x^2 - 14x + 24} \\ \underline{-(x^3 - 2x^2)} \\ 1x^2 - 14x \\ \underline{-(x^2 - 2x)} \\ -12x + 24 \\ \underline{-(-12x + 24)} \\ 0 \end{array}$$

$$\frac{(x-2)(x^2+x-12)}{(x-2)(x-3)(x+4)}$$