6-1

1) Linear binomial
2) Const. monomial
3) quartic trinomial
4) quartic trinomial
5) quad monomial
6) cubic trinomial
7)

8) $.00088x^3 + .223x^2 - 3.15x + 29.05$

$1203.09 in 2010

6-2, 1) $x=5$ m: 3

2) $x=0$ m: 1
$x=8$ m: 2

3) $x^2(x-4)^2$ $x=0$ m: 2
$x=4$ m: 2

4) $9x(x+3)(x-3)$ $x=0$ m: 1
$x=3$ m: 1
$x=-3$ m: 1

5) $(x+1)(x-3)(x-4)$

x^2-2x-3

x	x^3	$-2x^2$	$-3x$
-4	$-4x^2$	$8x$	12

$x^3-6x^2+5x+12$

6-2

6.) $x^2 - 2x + 1$

$x \quad x^3 \quad -2x^2 \quad x$

$-2 \quad -2x^2 \quad 4x \quad -2$

$x^3 - 4x^2 + 5x - 2$

7.) $x^2(x+3)(x-5)$

$x^2(x^2 - 2x - 15)$

$x^4 - 2x^3 - 15x^2$

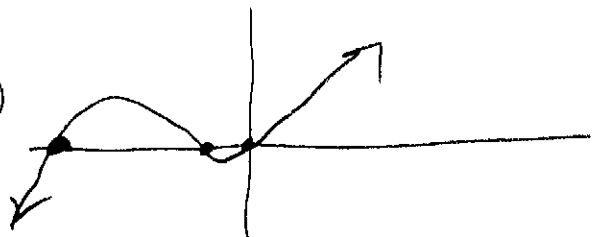
8.) $(x+2)^3 = x^3 + 6x^2 + 12x + 8$

$x^2 + 4x + 4$

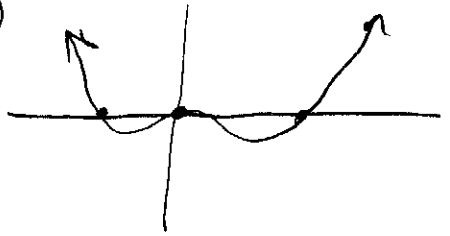
$x \quad x^3 \quad 4x^2 \quad 4x$

$2 \quad 2x^2 \quad 8x \quad 8$

9.) $2x(x+2)(x+3)$

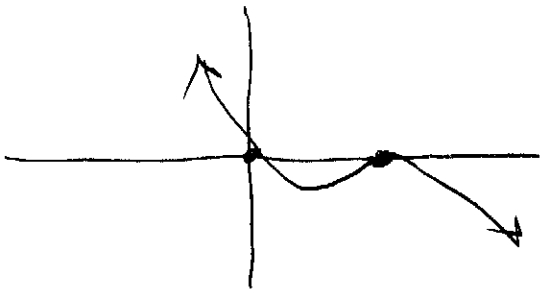


10.) $x^2(x-3)(x+2)$



11.) $-3x(x^2 - 6x + 9)$

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



$(x+7)(x+2)(x+8) = y$

$x^3 + 14x^2 + 58x + 64$

6-3

1) $\begin{array}{r|rrrr} -4 & 1 & 3 & -10 & -24 \\ & & -4 & 4 & 24 \\ \hline & 1 & -1 & -6 & 0 \end{array}$ yes

2) $\begin{array}{r|rrrr} 3 & 1 & 3 & -10 & -24 \\ & & 3 & 18 & 24 \\ \hline & 1 & 6 & 8 & 0 \end{array}$ yes!

$$\begin{array}{r} 2x+1 \\ x-5 \overline{)\, 2x^2+x-7} \\ -(2x^2-10x) \\ \hline 11x-7 \\ 11x-55 \\ \hline 48 \end{array}$$

$\boxed{2x+1+48/(x-5)}$

4) $$\begin{array}{r} x^2+6x+3 \\ x-1 \overline{)\, x^3+5x^2-3x-1} \\ -(x^3-x^2) \\ \hline 6x^2-3x \\ -(6x^2-6x) \\ \hline 3x-1 \\ 3x-3 \\ \hline 2 \end{array}$$

$\boxed{x^2+6x+3+2/x-1}$

5) $$\begin{array}{r} 3x^2-7x+7 \\ x+2 \overline{)\, 3x^3+x^2-7x+6} \\ -(3x^3+6x^2) \\ \hline -7x^2-7x \\ -(-7x^2-14x) \\ \hline 7x+6 \\ 7x+14 \\ \hline -8 \end{array}$$

$\boxed{3x^2-7x+7+-8/x+2}$

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6-3

6.) $\begin{array}{r|rrrr} 5 & 1 & -8 & 17 & -10 \\ & & 5 & -15 & 10 \\ \hline & 1 & -3 & 2 & 0 \end{array}$

$\boxed{x^2-3x+2}$

7.) $\begin{array}{r|rrrr} -2 & 1 & 5 & -1 & -9 \\ & & -2 & -6 & 14 \\ \hline & 1 & 3 & -7 & 5 \end{array}$

$\boxed{x^2+3x-7+5/x+2}$

8.) $\begin{array}{r|rrrr} 2 & 3 & -4 & -5 & 1 \\ & & 6 & 4 & -2 \\ \hline & 3 & 2 & -1 & -1 \end{array}$

$3x^2+2x-1+-1/x-2$

9.) $\begin{array}{r|rrrr} -3 & 1 & 6 & 10 & 3 \\ & & -3 & -9 & -3 \\ \hline & 1 & 3 & 1 & 0 \end{array}$

$\boxed{x^2+3x+1}$

10.) $\begin{array}{r|rrrr} -5 & 1 & 3 & -13 & -15 \\ & & -5 & 10 & 15 \\ \hline & 1 & -2 & -3 & 0 \end{array}$

$\cancel{x=-5, 3, -1}$

$\boxed{(x+5)(x-3)(x+1)}$

x^2-2x-3

$(x-3)(x+1)$

11.) $\begin{array}{r|rrrr} 2 & 1 & -3 & -10 & 24 \\ & & 2 & -2 & -24 \\ \hline & 1 & -1 & -12 & 0 \end{array}$

$\boxed{x=2, 4, -3}$

$\boxed{(x-2)(x-4)(x+3)}$

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

12.) $\begin{array}{r|rrrr} -4/3 & 6 & 2 & -11 & 12 \\ & & -8 & 8 & -4 \\ \hline & 6 & -6 & -3 & 8 \end{array}$

$\boxed{6x^2-6x-3+8/(3x+4)}$

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6-3 Cont.

13) 1 | 1 2 0 1 −3
1 3 3 4
1 3 3 4 1

$x^3+3x^2+3x+4+\frac{1}{x-1}$

14) 2 | 1 0 −3 0 −10
2 4 2 4
1 2 1 2 −6

$x^3+2x^2+x+2+\frac{-6}{x-2}$

15) 8 | 1 −16 79 −120
8 −64 120
1 −8 15 0

$x^2-8x+15$

$(x-5)(x-3)$

$(x-5)(x-3)(x-8)$

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WS 6.4

Solve: $x^{3/2}$,

$\frac{-b \pm \sqrt{}}{a}$

1.) $(2x-3)(4x^2+6x+1)$

2.) $(x+1)(x^2-4x+16)$

3.) $(x+2)(x-2)(x+1)(x-1)$

4.) $(x^2-8)(x+2)(x-2)$

5.) $(x+3)(x-3)(x^2+9)$

6.) $(x^2+7)(x+4)$

7.) $x=-4.76 \quad x=-1.9 \quad x=1.66$

8.) $x=.95 \quad x=-.37$

9.) $x=-.67 \quad x=0 \quad x=1.4$

9

6-5

1.) $2-3i \quad -\sqrt{7}$

2.) $3+\sqrt{2} \quad 1-\sqrt{3}$

3.) $4i \quad 6+i$

4.) $5+\sqrt{6} \quad -2-\sqrt{10}$

5.) $\frac{p}{q}$: $\pm 1, \frac{1}{2}, 2, 4$

2	2	0	-8	0	4
		4	8	2	-4
-2	2	4	-1	-2	0
		-4	0	2	
	2	0	-1	0	

$2x^2-1=0$

$x=\pm\frac{1}{\sqrt{2}}$

ROOTS

$x=2, -2, \pm\frac{1}{\sqrt{2}}$

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6) $\frac{P}{q}: \pm 1, 2, 4, 8$

$$\begin{array}{r|rrrr} -1 & 1 & -5 & 2 & 8 \\ & & -1 & 6 & -8 \\ \hline & 1 & -6 & 8 & 0 \end{array}$$

$(x-4)(x-2)=0$

$x=2, 4, -1$

7) $\frac{P}{q}: \pm 1, \frac{1}{2}, 2, 3, \frac{3}{2}, 4, 6, 12$

$$\begin{array}{r|rrrr} -3 & 2 & 5 & -17 & -12 \\ & & -6 & 3 & 42 \\ \hline & 2 & -1 & -14 & 30 \end{array}$$

$2x^2+7x-4=0$

$(2x-1)(x+4)=0$

$x=\frac{1}{2}, -4, -3$

8) $6x^3+10x^2+5x+0=0$

$\frac{P}{q}=0$ $\quad x(6x^2+10x+5)$

$x=0$ $\quad \frac{-10\pm\sqrt{100-120}}{2(6)} = \frac{-10\pm\sqrt{-20}}{2}$

$\frac{-5\pm\sqrt{5}i}{6}, 0$

9) $(x-5)(x+2i)(x-2i)$

$(x-5)(x^2+4)$

$x^3-5x^2+4x-20$

10) $(x-i)(x+i)(x+7)$

$(x^2+1)(x+7)$

x^3+7x^2+x+7

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6-6

1) $0 = -4x(x^2-25)$

$-4x(x+5)(x-5)$

$\boxed{x=0, 5, -5}$

2) x^3+3x^2+6x+4

$\frac{p}{q}: 1, 2, 4$

$$\begin{array}{r|rrrr} -1 & 1 & 3 & 6 & 4 \\ & & -1 & -2 & -4 \\ \hline & 1 & 2 & 4 & 0 \end{array}$$

$x^2+2x+4=0$

$\frac{-2 \pm \sqrt{4-4(1)(4)}}{2(1)} = \frac{-2 \pm \sqrt{-12}}{2}$

$\frac{-2 \pm 2\sqrt{3}\,i}{2} = \boxed{-1 \pm \sqrt{3}\,i, -1}$

3) x^3-4x^2+8

$\frac{p}{q}: \pm 1, 2, 4, 8$

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

$x^2-2x-4=0$

$\frac{-(-2) \pm \sqrt{4-(4)(1)(-4)}}{2} \quad \frac{2 \pm \sqrt{\cancel{18}\,20}}{2}$

$\boxed{\cancel{\frac{1 \pm 3\sqrt{2}}{2}}\ 2}$ $2\sqrt{5}$

$\boxed{1 \pm \sqrt{5}, 2}$

6.1 (Cont)

4) $x^3 - 9x^2 + 27x - 27$

$\frac{p}{q}$: $\pm 1, 2, 3, 9, 27$

By CALC:

$$\begin{array}{r|rrrr} 3 & 1 & -9 & 27 & -27 \\ & & 3 & -18 & 27 \\ \hline & 1 & -6 & 9 & 0 \end{array}$$

$x^2 - 6x + 9$

$(x-3)^2 = 0$

$\boxed{x = 3, 3, 3}$

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