Polynomial #7

① -4 | 1 $\quad -3$ $\quad K$ $\quad -12$

$\quad\quad -4$ $\quad 28$ $\quad -112-4K$

1 $\quad -7$ $\quad 28+K$ $\quad -124-4K$

$-124-4K=0$

$-4K=124$

$K=-31$

② -7, multiplicity 2

$5/3$, multiplicity 1

$-6/7$, multiplicity 3

③ $f(x)=x^4-x^3-6x^2$

$0=x^2(x^2-x-6)$

$0=x^2(x-3)(x+2)$

0, mult. 2

3, mult. 1

-2, mult. 1

④ $f(x)=(x-5)^3\cdot x\cdot(x-7)^2$

$=x(x-5)^3(x-7)^2$

⑤ $f(x)=(x+3)(x+2)^2(x-9)$

⑥ 5

⑦ 6

⑧ -1 | -3 $\quad -15$ $\quad -12$ $\quad 0$

$\quad\quad 3$ $\quad 12$ $\quad 0$

-3 $\quad -12$ $\quad 0$ $\quad 0$

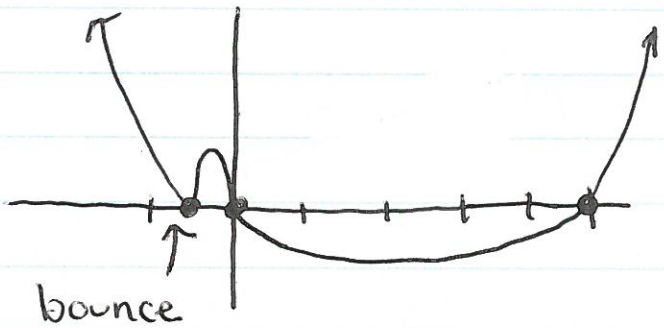
$-3x^2-12x=0$

$-3x(x+4)=0$

0 $\quad -4$

zeros $(-1, 0, -4)$

⑨



END BEHAVIOR

degree = 6 up, up

$x\to-\infty, f(x)\to\infty$, $x\to\infty, f(x)\to\infty$

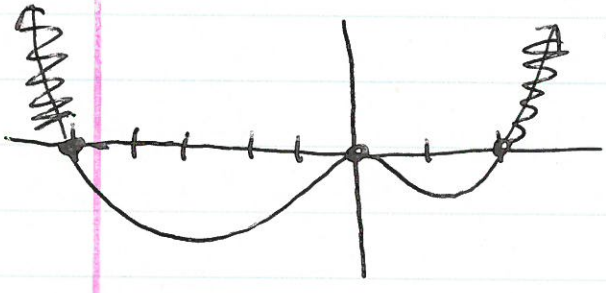
yint $(0,0)$

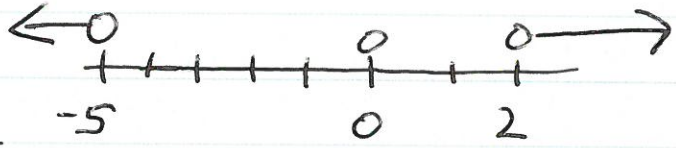
xint $(0,0)$ $(-\frac{1}{2},0)$ $(5,0)$

(10) $2t^4+6t^3-20t^2>0$

$2t^2(t^2+3t-10)>0$

$2t^2(t+5)(t-2)>0$





$x<-5$ or $x>2$

(11)

3	1	-11	41	-51
		3	-24	51
	1	-8	+17	0

$x^2-8x+17=0$

use quadratic formula

$$\frac{8\pm\sqrt{-4}}{2}$$

$$\frac{8\pm 2i}{2}$$

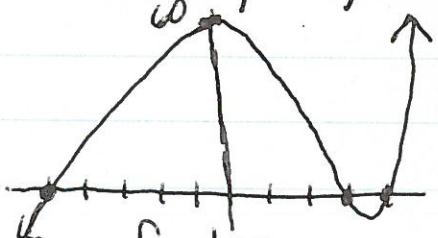
Solutions: $3, 4+i, 4-i$

(12)

-5	1	-2	-23	60
		-5	35	-60
	1	-7	12	0 ← shows $(x+5)$ is a factor

$x^2-7x+12$

factor → $(x+5)(x-3)(x-4)$



(13) $(x+2)(x-3i)(x+3i)$ multiply first, it is easier

$(x+2)(x^2+3ix-3ix-9i^2)$

$i^2=-1$

$(x+2)(x^2+9)$

$x^3+2x^2+9x+18$

14.) $x+2 \overline{)3x^4+0x^3-4x^2+2x-1}$

$3x^3-6x^2+4x-6 + \frac{11}{(x+2)}$

$-3x^4+6x^3$

$-6x^3-4x^2$

$-(-6x^3-12x^2)$

$8x^2+2x$

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

$-6x-1$

$-(-6x-12)$

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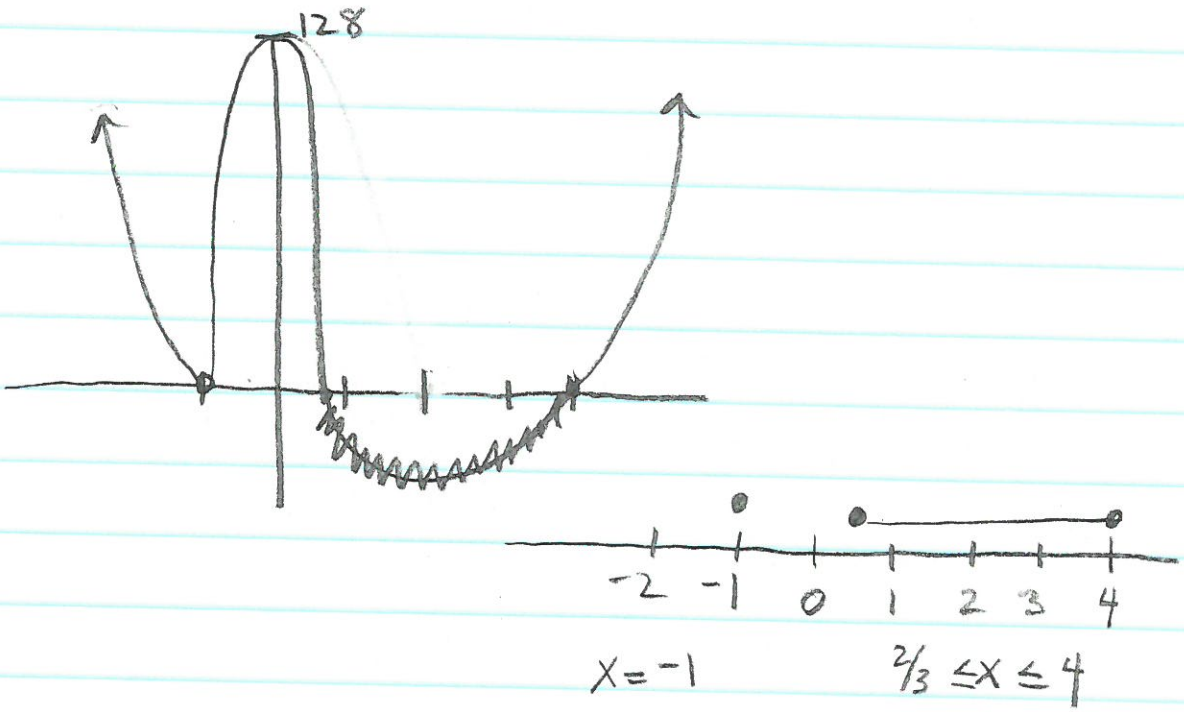
(15)



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

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

$(x^2+x-20)(x+1)$

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

$x^3+2x^2-19x-20$