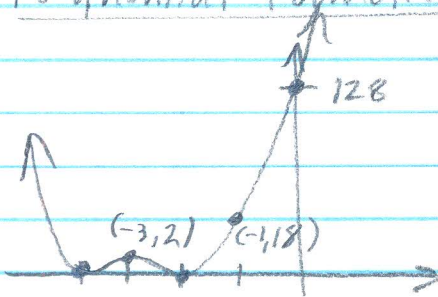


Polynomial Functions Review WS 2

①



$$f(0) = 128$$

$$f(-1) = 18$$

$$f(-3) = 2$$

②

$$\begin{array}{r|rrrrr} 2 & 1 & -8 & 5 & 14 & \\ & & 2 & -12 & -14 & \\ \hline & 1 & -6 & -7 & 0 & \end{array}$$

$$x^2 - 6x - 7 = 0$$

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

③

$$\begin{array}{r|rrrrrr} -11 & 1 & -3 & 0 & 3 & -1 & \\ & & -1 & 4 & -4 & 1 & \\ \hline 11 & 1 & -4 & 4 & -1 & 0 & \\ & & 1 & -3 & 1 & & \\ \hline & 1 & -3 & 1 & 0 & & \end{array}$$

$$x^2 - 3x + 1 = 0$$

$$x = \frac{3 \pm \sqrt{5}}{2}$$

$$\left\{ +1, \frac{3 \pm \sqrt{5}}{2} \right\}$$

④

$$\begin{array}{r|rrrrr} -2 & 2 & -3 & -11 & 6 & \\ & & -4 & 14 & -6 & \\ \hline & 2 & -7 & 3 & 0 & \end{array}$$

$$2x^2 - 7x + 3 = 0$$

$$(2x-1)(x-3) = 0$$

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

⑤

$$\begin{array}{r|rrrrrr} 3 & 1 & -3 & -3 & 9 & -4 & 12 \\ & & 3 & 0 & -9 & 0 & -12 \\ \hline & 1 & 0 & -3 & 0 & -4 & 0 \end{array}$$

$$x^4 - 3x^2 - 4 = 0$$

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

$$x = \pm 2, x = \pm i, x = 3$$

⑥ $x = \frac{1}{2}$ $x = \frac{3}{4}$
 $(x - \frac{1}{2})(x - \frac{3}{4}) = y$
 $(2x - 1)(4x - 3) = y$
 $8x^2 - 6x - 4x + 3 = y$
 $y = 8x^2 - 10x + 3$

	x	-2	$-i$
x	x^2	$-2x$	$-xi$
-2	$-2x$	$+4$	$+2i$
$+i$	$+xi$	$-2i$	$-i^2$

⑦ $x = 3$ $x = 2+i$ $x = 2-i$
 $y = (x-3)(x-2-i)(x-2+i)$
 $y = (x-3)(x^2 - 4x + 5)$
 $y = x^3 - 7x^2 + 17x - 15$

⑧ $x = 2$ $x = \sqrt{3}$ $x = -\sqrt{3}$
 $y = (x-2)(x-\sqrt{3})(x+\sqrt{3})$
 $y = (x-2)(x^2 - 3)$
 $y = x^3 - 2x^2 - 3x + 6$

⑨ $y = (x+1)(x-3-i)(x-3+i)$
 $y = (x+1)(x^2 - 6x + 10)$
 $y = x^3 - 5x^2 + 4x + 10$

$x = 3+i$
 and
 $x = 3-i$ } always come in pairs

- ⑩ a) zeros: $-3, -\frac{1}{2}, 5$
 b) factors: $(x+3)(2x+1)(x-5)$
 c) y-int: $(0, -15)$
 d) $(1, -48)$

⑪ $x = 3+i$ $x = 3-i$
 $(x-3-i)(x-3+i)$
 $x^2 - 6x + 10$

$$\begin{array}{r} x^2 - 6x + 10 \\ \times x^2 - 4 \\ \hline x^4 - 6x^3 + 6x^2 + 24x - 40 \\ - (x^4 - 6x^3 + 10x^2) \\ \hline -4x^2 + 24x - 40 \\ - (-4x^2 + 24x - 40) \\ \hline 0 \end{array}$$

$x^2 - 4 = 0$

$x^2 = 4$

$x = \pm 2, 3 \pm i$