p. 316 #18

$-2x^4+100=0$

$y=x^2$

$-2y^2+100=0$

$100-2y^2=0$

$50-y^2=0$

$(\sqrt{50}-y)(\sqrt{50}+y)=0$

$y=\sqrt{50}$ $y=-\sqrt{50}$

$x^2=\sqrt{50}$ $x^2=-\sqrt{50}$

$x=\pm\sqrt{\sqrt{50}}$ $x=\pm\sqrt{-\sqrt{50}}$

$=\pm 2.66$ $x=\pm i\sqrt{\sqrt{50}}$

$=\pm 2.66i$

Reminder:

if $x-a$ is a factor of $P(x)$

then <u>remainder</u> of $P(x)\div(x-a)$ is zero.

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also: if a is a zero, then remainder of $\frac{P(x)}{x-a}$ is zero, and $x-a$ is a factor

Remainder Theorem:

remainder of $\frac{P(x)}{x-a} = P(a)$

$P(x)$ is a polynomial function

input: x

output: $y = P(x)$

$P(x)$: output of function P when input is x

$\therefore$ $P(a)$ is output of function P when input is a

so: if $\frac{P(x)}{x-2}$ gets remainder of -3

this means:

$P(2) = -3$

... OR ...

if $\frac{P(x)}{x+4}$ gets remainder of 0

then:

$P(-4) = 0$

also: $x+4$ is a factor

$x = -4$ is a zero

#21 $x^3 + x = x^2 + 1$

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

factoring by grouping $x^2(x-1) + 1(x-1) = 0$

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

$x^2 + 1 = 0$ $\quad$ $x - 1 = 0$

$x^2 = -1$ $\quad$ $x = 1$

$x = \pm i$

#21 $x^3 + x = x^2 + 1$

another way.

#25 p. 317

width = w

height = $w - 1$

length = height + 4

$= w - 1 + 4$

$= w + 3$

- width · length · height
-
- $V = w \cdot (w+3) \cdot (w-1) = 36$

choose the 1 real answer

p. 321 #15 $P(x) \div (x-5)$

$= 5x^2 + 3x + 12$

remainder: 7

$$x-5 \;\overline{)\; P(x)}\;\; 5x^2+3x+12 \;\; R\,7$$

p. 321 # 2

$$x-3 \overline{)\, 9x^3-15x^2+4x+0}$$

$9x^2+12x+40$

$9x^3-27x^2$

$12x^2+4x$

$12x^2-36x$

$40x+0$

$40x-120$

120

Rem.