PreCalc 12 Final Review Chp 1

Note Title 2016-05-27

1.1) Use long division if you are unsure about synthetic or not a monic linear binomial divisor. $(bx-a)$ $b=1$
for long or syn, pad missing powers "placeholders"
We need div to factor higher order polynomials and to calculate SA.

1.2 - Remainder Theorem (for $x-a$) $a \in \mathbb{R}$
Use $P(a)$ to calc remainder. a_0
eg) $P(x) = x^3+2x^2-5x+9$
$P(1) = 1+2-5+9 = 7$ is rem.
$P(-1) = -1+2+5+9 = 15$ is rem.
Use this mostly for Factor Theorem $P(a)=0$, so $x-a$ is a factor of $P(x)$. Don't want to do division to find factors. Then use division to reduce polynomial to find more factors.
Use Factor Property to find potential 'a's. Start with the small factors. $a_0 \in \mathbb{Z}$ - constant term
Use substition when solving problems such as:
Find k when $P(x) = x^3+kx^2-3x+5$, $P(1)=4$
Recall: Polynomial is $P(x) = a_n x^n + a_{n-1}x^{n-1} + a_{n-2}x^{n-2} + \ldots + a_0$

1.3) Recall different odd/even definitions.
- numbers, degree, multiplicity, functions.
Multiplicity - # of times a root is repeated
- even (bounces), odd (goes thru) x-axis
- $(x-3)^2$ $(x+2)^5$

Degree - exponent of term with highest power
- even ($a_n>0$ CU, $a_n<0$ CD)
- odd ($a_n>0$ III→I, $a_n<0$ II→IV) leading coeff
- Degree is > # of hills & valleys.

Also when graphing, graph y-int ($x=0$), and x-ints (if easy)

When using calculator, domain: use $-|a_0|, |a_0|$ (because factor prop)

1.4) Local/Global Min/Max - # < degree.
Functions - we're not solving (zeroes)
Equations - we're solving (roots)

1.5 - Know your formulas - review on your own.
Read carefully / highlight keywords.
Use answer as variable.
Create a function with relations (formulas)
- Substitute variable into relations.

Box - $V = lwh$.

$l = \frac{3}{2}w + 5$
$h = \frac{4}{5}w - 4$
) subst

$V = (\frac{3}{2}w + 5)\, w\, (\frac{4}{5}w - 4)$

Should only have one variable