Graphing Polynomials II (3.4) p148 day 7

take up quiz 4

1. Find the remainder when:
a) $8x^3-3x^2+5x+16$ is divided by $(x+1)$
b) x^3+9x^2-5x+3 is divided by $x-2$

2. What is the degree of $x^3-4x^3-x^2+16x-12$

3. State the end behaviour of $y=x^2+5x-12$

4. Divide $4x^3-x^2+16x-12$ by $(x-2)$

5. Factor. x^3-4x^2+x+6

6. Solve $3^{x+2}=5^x$

7. The height of the tide in the harbour is modeled by $d(t)=-3\cos\frac{\pi}{6}t+5$ where d is the depth in feet and t is the time in hours
If t=0 is midnight, find the height of the water at 8 am.

8. Find the new co-ordinates of the point (5, -3) after the transformation $y=3f(x-5)+2$

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Enneagram 6 The Loyalist

Committed, loyal, responsible
Deep faith, relationships

Core longing: security & support
Core fear: betrayal, no support
Deadly sin: fear

Inner committee
Anxious, suspicious

Father-son entrepreneur

Worst Case Scenario
At their best in a network
Defend their beliefs more than themselves

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HW: p148#9abd

9. Without using technology, sketch the graph of each function. Label all intercepts.
a) $f(x)=x^4-4x^3+x^2+6x$
b) $y=x^3+3x^2-6x-8$
c) $y=x^3-4x^2+x+6$
d) $h(x)=-x^3+5x^2-7x+3$
e) $g(x)=(x-1)(x+2)^2(x+3)^2$
f) $f(x)=-x^4-2x^3+3x^2+4x-4$

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

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

$y=-(x-1)^2(x-3)$

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ex1: Create a polynomial function with the following roots.

a) 2, 3, and -5

$y=(x-2)(x-3)(x+5)$
$=(x-2)(x^2+2x-15)$
$=x^3+2x^2-15x$
$-2x^2-4x+30$
$y=x^3-19x+30$

b) 2, 4, and a double root at -1

$y=(x-2)(x-4)(x+1)^2$
$=(x^2-6x+8)(x^2+2x+1)$
$=x^4+2x^3+x^2$
$-6x^3-12x^2-6x$
$+8x^2+16x+8$
$y=x^4-4x^3-3x^2+10x+8$

10b $y=-(x+4)(x+1)(x-3)$

$=-$

$=-(\quad)$

$=-x^3\ldots+12$

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ex2: A block of ice is melting in the sun. It begins with dimensions 3 ft by 5 ft by 4 ft high. As it melts, it loses the same length off each dimension. When it reaches a volume of 24 ft^3, how much has it lost from each dimension?

x rep amt lost each dim.

$V=l\times w\times h$
$24=(5-x)(4-x)(3-x)$
$24=(5-x)(12-7x+x^2)$
$24=60-35x+5x^2-12x+7x^2-x^3$
$24=60-47x+12x^2-x^3$
$x^3-12x^2+47x-36=0$
$f(1)=1-12+47-36=0$
$\therefore (x-1)$

1	-12	47	-36
	-1	11	-36
1	-11	36	0

$\therefore (x-1)(x^2-11x+36)=0$

$x=\frac{11\pm\sqrt{121-4(1)(36)}}{2(1)}$
$=\frac{11\pm\sqrt{121-144}}{2}$
neg under $\sqrt{}$
no solutions here
$\therefore x=1$ only soln

loses 1 ft from each dim.

12

12. $x(25x)(10x+1)=2100$

$250x^3+25x^2-2100=0 \quad \div 25$

$10x^3+x^2-84=0$

$f(1)\neq 0$

$f(-1)\neq 0$

$f(2)=80+4-84=0$

$\therefore x-2$

$-2 \mid 10 \;\; 1 \;\; 0 \;\; -84$

$\quad\quad -20 \;\; -42 \;\; -84$

$\quad 10 \;\; 21 \;\; 42 \;\; 0$

$\therefore (x-2)(10x^2+21x+42)=0$

$x=\dfrac{-21\pm\sqrt{21^2-4(10)(42)}}{2(10)}$

$=\dfrac{-21\pm\sqrt{441-1680}}{20}$ not real

$\therefore x=2$

dim are $2\times 50\times 21$

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HW: p148#9ce, 11