Written assignments to hand in.

Section 3.2
26, 38
due Monday 11/13

Section 3.3
12, 58
due Tuesday 11/14

Section 3.5
24, 32
due Wednesday 11/15

Discussion Problems From the department syllabus
These are not to hand in.

Section 3.2,
3.3: 15-23 odd, 41-47 odd

WebAssign
3.1 + 3.2 Sunday 11/12 9pm

Section 3.3

(23) $\dfrac{x^6+x^4+x^2+1}{x^2+1}$

$= x^4+1$

$$
\begin{array}{r}
x^4+1 \\
x^2+1 \overline{)\,x^6+x^4+x^2+1} \\
\underline{-(x^6+x^4)} \\
x^2+1 \\
\underline{x^2+1} \\
0
\end{array}
$$

(20)

$$x^2-5x+1 \;\overline{)\; x^4-3x^3+\quad x-2}$$

$$\frac{x^2+2x+9}$$

$$-(x^4-5x^3+x^2)$$

$$2x^3-x^2+x-2 \quad \leftarrow \text{first remainder, deg} = 3$$

$$-(2x^3-10x^2+2x)$$

$$9x^2-x-2 \quad \leftarrow 2^{nd} \text{ remainder deg} = 2$$

$$-(9x^2-45x+9)$$

$$44x-11 \quad \leftarrow \text{Final remainder deg} = 1 < 2$$

$$\frac{x^4-3x^3+x-2}{x^2-5x+2} = x^2+2x+9+\frac{44x-11}{x^2-5x+1}$$

(59) $P(x) = x^3-x^2-11x+15$ Confirm that $c=3$ is a root of $P(x)$. in other words, $P(3)=0$.

$P(3) = 27-9-33+15 = 0$

By The Factor Theorem we know that

$x-3$ divides $P(x)$ evenly.

$$x-3 \;\overline{)\; x^3-x^2-11x+15}$$

$$\frac{x^2+2x-5}$$

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

$$2x^2-11x+15$$

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

$$-5x+15$$

$$-5x+15$$

$$0$$

Therefore $P(x) = x^3 - x^2 - 11x + 15$

$= (x-3)(x^2+2x-5)$ ← doesn't factor further.

quadratic formula for x^2+2x-5 $\quad x = \frac{-2 \pm \sqrt{4+20}}{2} = \frac{-2 \pm \sqrt{24}}{2}$

$= \frac{-2 \pm 2\sqrt{6}}{2} = -1 \pm \sqrt{6}$

roots of $P(x)$ are $\boxed{x = 3, -1+\sqrt{6}, -1-\sqrt{6}}$