3. (a) $3x-2=-2(x-5)$

$3x-2=-2x+10$

$5x=12$

$x=\frac{12}{5}$

(b) $2x^2+5x=-4$

$2x^2+5x+4=0$

$x=\frac{-5\pm\sqrt{-7}}{4}$

$x=\frac{-5\pm i\sqrt{7}}{4}$

(c) $x^3-2x^2-5x+6=0$

$$\begin{array}{r|rrrr} -2 & 1 & -2 & -5 & 6 \\ & & -2 & 8 & -6 \\ \hline & 1 & -4 & 3 & 0 \end{array}$$

$(x+2)(x^2-4x+3)=0$

So,

$\underline{\underline{x=-2}}$ OR $x=\frac{4\pm\sqrt{4}}{2}$

$\underline{\underline{x=3,\ 1}}$

(d) $\sqrt{3x-2}-2\sqrt{5x-4}=0$

$(\sqrt{3x-2})^2=(2\sqrt{5x-4})^2$

$3x-2=4(5x-4)$

$3x-2=20x-16$

$14=17x$

$\frac{14}{17}=x$

---

4. $f(x)=x^5-2$, so $f^{-1}(x)=(x+2)^{1/5}$

---

5. $f(x)=4x^2-5$, $g(x)=-x$

(a) $f(g(x))=f(-x)$

$=4(-x)^2-5$

$=4x^2-5$

(b) $g(f(x))=g(4x^2-5)$

$=-(4x^2-5)$

$=-4x^2+5.$

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6. $f(x)=x^4+3x^3-7x^2-27x-18$

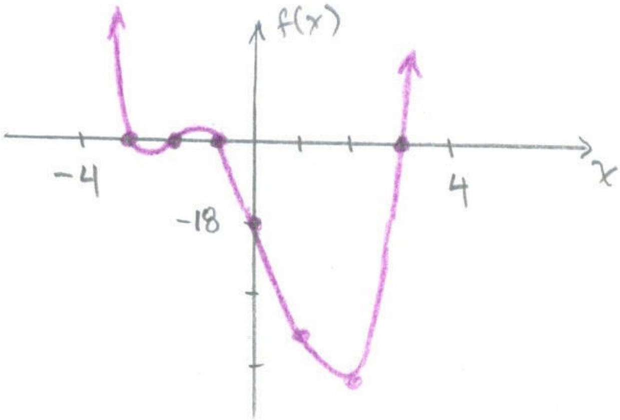
(a)
$$\begin{array}{r|rrrrr} -1 & 1 & 3 & -7 & -27 & -18 \\ & & -1 & -2 & 9 & 18 \\ \hline -2 & 1 & 2 & -9 & -18 & \boxed{0} \\ & & -2 & 0 & 18 & \\ \hline & 1 & 0 & -9 & \boxed{0} & \end{array}$$

So, $f(x)=(x+1)(x+2)(x^2-9)$

THEN THE ROOTS ARE

$\underline{\underline{x=-1,\ -2,\ \pm 3.}}$

(b) y-INT = (0, −18)



(c) $f(1) = -48$

$f(2) = -60$

7. SINCE WE ARE GIVEN THE INVERSE OF THE COEFFICIENT MATRIX,

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \frac{1}{12}\begin{bmatrix} 6 & 2 & -2 \\ 3 & -7 & 1 \\ 3 & -3 & -3 \end{bmatrix}\begin{bmatrix} 12 \\ 7 \\ 13 \end{bmatrix}$$

$$= \frac{1}{12}\begin{bmatrix} 60 \\ 0 \\ -24 \end{bmatrix}$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 5 \\ 0 \\ -2 \end{bmatrix}$$