1. 2-POINT: $y-2=\frac{-3-2}{-2-1}(x-1)$ OR $y+3=\frac{2+3}{1+2}(x+2)$

   SLOPE-POINT: $y-2=\frac{5}{3}(x-1)$ OR $y+3=\frac{5}{3}(x+2)$

   SLOPE-INT: $y=\frac{5}{3}x+\frac{1}{3}$

   STANDARD: $\frac{5}{3}x-y=-\frac{1}{3}$

2. $6x^3+x^2-x=x(6x^2+x-1)$

   $x=\frac{-1\pm\sqrt{1^2-4\cdot6(-1)}}{2\cdot6}=\frac{-1\pm5}{12}=-\frac{1}{2},\frac{1}{3}$

   ROOTS ARE $\boxed{-\frac{1}{2},0,\frac{1}{3}}$ AND LEADING COEFF. IS POSITIVE:
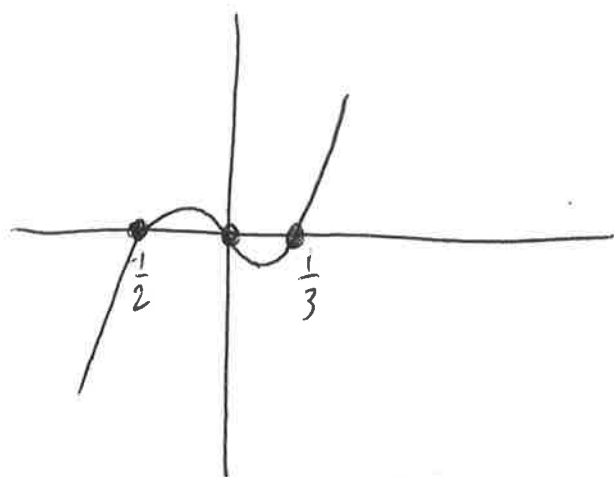
   

3. (a) $b^2-4ac=(-2)^2-4\cdot1\cdot1=0\Rightarrow$ 1 ROOT

   (b) $b^2-4ac=1^2-4(-3)2=\underline{25}\Rightarrow2$ ROOTS

   (c) $b^2-4ac=1^2-4(-3)(-2)=-23\Rightarrow0$ ROOTS

4. $x^4-1=(x^2+1)(x^2-1)=(x^2+1)(x+1)(x-1)\Rightarrow$ ROOTS ARE $-1,1$.

   $\underset{-1}{\overset{(+)}{\phantom{|}}}\quad\underset{1}{\overset{(-)}{\phantom{|}}}\quad\overset{(+)}{\phantom{|}}$   $\begin{array}{l}(-2)^4-1>0\\0^4-1<0\\2^4-1>0\end{array}$

   $\therefore\{$ dom f : $f(x)>0\}=(-\infty,-1)\cup(1,\infty)$

**5.**
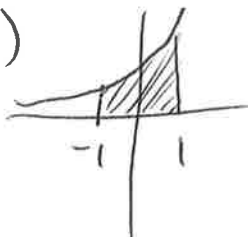
$$
\begin{array}{r}
3x^2+7x-6 \\
x+1\overline{\smash{\big)}\ 3x^3+10x^2+x-6} \\
\underline{3x^3+3x^2} \\
7x^2+x \\
\underline{7x^2+7x} \\
-6x-6
\end{array}
$$

$$x = \frac{-7\pm\sqrt{7^2-4\cdot3(-6)}}{2\cdot3} = \frac{-7\pm11}{6} = -3, \frac{2}{3}$$

$$\Rightarrow 3x^3+10x^2+x-6 = (x+3)(x+1)\left(x-\frac{2}{3}\right)$$

**6.** $\quad 2P = P\left(1+\frac{r}{1}\right)^{1\cdot10} \rightarrow 2 = (1+r)^{10} \rightarrow 2^{1/10} = 1+r$

$$\Rightarrow r = 2^{1/10} - 1 \approx 0.0718 \text{ or } 7.18\%$$

**7. (a)**

 $\quad A = \int_{-1}^{1} e^x \, dx = e^x\Big|_{-1}^{1} = e - \frac{1}{e} \approx 2.35$

**(b)** FROM Q5:



$$f(-4)<0, \ f(-2)>0, \ f(0)<0, \ f(1)>0$$

 $\quad \rightarrow A = \int_{-3}^{-1} f(t)\,dt - \int_{-1}^{2/3} f(t)\,dt$

$$= \left(\frac{3x^4}{4}+\frac{10x^3}{3}+\frac{x^2}{2}-6x\right)\Big|_{-3}^{-1} - \left(\frac{3x^4}{4}+\frac{10x^3}{3}+\frac{x^2}{2}-6x\right)\Big|_{-1}^{2/3}$$

$$= \left[\frac{3(-3)^4}{4}+\frac{10(-3)^3}{3}+\frac{(-3)^2}{2}-6(-3)\right] - \left[\frac{3(-1)^4}{4}+\frac{10(-1)^3}{3}+\frac{(-1)^2}{2}-6(-1)\right]$$

$$- \left\{\left(\frac{3(-1)^4}{4}+\frac{10(-1)^3}{3}+\frac{(-1)^2}{2}-6(-1)\right) - \left(\frac{3(2/3)^4}{4}+\frac{10(2/3)^3}{3}+\frac{(2/3)^2}{2}-6\left(\frac{2}{3}\right)\right)\right\}$$

$$= \frac{5581}{324}$$