

7. $f(x) = \frac{x^4 - 16}{x^3}$

$$x^3 \overline{) \begin{array}{r} x - \frac{16}{x^3} \\ x^4 + 0x^3 + 0x^2 + 0x - 16 \\ -x^3 \\ \hline -16 \end{array}}$$

$y=x$ is oblique asy.

9. $P(x) = a(x+4)(x+2)(x-1)^2(x-3)$
 $-1 = a(0+4)(0+2)(0-1)^2(0-3)$
 $-1 = a(4)(2)(1)(-3)$
 $-1 = a(-24)$

$$\frac{1}{24} = a$$

$$P(x) = \frac{1}{24}(x+4)(x+2)(x-1)^2(x-3)$$

10. a) $x^3 e^x - x^2 e^x - 2x e^x = 0$

$$x e^x (x^2 - x - 2) = 0$$

$$x e^x (x-2)(x+1) = 0$$

$x=0$ $e^x \neq 0$ $x=2$ $x=-1$

b) $3^{x+1} = 7^{2x-1}$

$$\ln 3^{x+1} = \ln 7^{2x-1}$$

$$(x+1) \ln 3 = (2x-1) \ln 7$$

$$x \ln 3 + \ln 3 = 2x \ln 7 - \ln 7$$

$$x \ln 3 - 2x \ln 7 = -\ln 7 - \ln 3$$

$$x (\ln 3 - 2 \ln 7) = -\ln 7 - \ln 3$$

$$x = \frac{-\ln 7 - \ln 3}{\ln 3 - 2 \ln 7}$$

$$x \approx 1.09$$