$$\frac{2x^4 - 3x^3 + 5x^2 - 10}{x^3 + 2x^2 - 1}$$

Slant asymptote part

purplemath.com

$$\begin{array}{r} 2x - 7 \\ x^3 + 2x^2 - 1 \;\overline{)}\; 2x^4 - 3x^3 + 5x^2 + 0x - 10 \\ \underline{-2x^4 \mp 4x^3 \qquad + 2x} \\ -7x^3 + 5x^2 + 2x - 10 \end{array}$$

$y = 2x - 7$ is slant asymptote.

Irreducible Quadratic Factor Part:

See last two pages of Monday notes.

Interest compounded ...

$(a^b)^c = a^{bc}$

How long will it take to double your money, if APR is 7.3% and interest is compounded ...

... daily? $\left(\left(1+\frac{.073}{365}\right)^{365}\right)^t$

$A = P\left(1+\frac{r}{m}\right)^{mt} = 2P$

$P\left(1+\frac{.073}{365}\right)^{365t} = 2P$

$\Rightarrow \ln\left(\left(1+\frac{.073}{365}\right)^{365t}\right) = \ln(2)$

$365t \ln\left(1+\frac{.073}{365}\right) = \ln(2)$

$t = \frac{\ln(2)}{365\ln\left(1+\frac{.073}{365}\right)}$

$P\left(1+\frac{r}{m}\right)^{mt} = 2P$

$\left(1+\frac{r}{m}\right)^{mt} = 2$

} Solve it symbolically

$mt\ln\left(1+\frac{r}{m}\right) = \ln(2)$

$t = \frac{\ln(2)}{m\ln\left(1+\frac{r}{m}\right)} = \frac{\ln(2)}{365\ln\left(1+\frac{.073}{365}\right)}$

Let $1+\frac{r}{m} = u$

$P u^{mt} = 2P$

$u^{mt} = 2$

$mt\ln u = \ln(2)$

$t = \frac{\ln(2)}{m\ln u} = \frac{\ln(2)}{365\ln\left(1+\frac{.073}{365}\right)}$

```
ln(2/50
      -3.218875825
ln(2)/50
      .0138629436
ln(2)/(365*ln(1+
.073/365))
      9.496116342
```

```
      .0138629436
n(2)/(365*ln(1+
073/365))
      9.496116342
n(2)/365*ln(1+.
73/365)
 3.797686987E-7
```

$\frac{\ln(2)}{365} \cdot \ln\left(1+\frac{.073}{365}\right)$

Bad!

... monthly: $P\left(1+\frac{.073}{12}\right)^{12t} = 2P$

... continuously: $Pe^{.073t} = 2P$

What's the present value of $10,000 in 11 years, if interest rate is 8.5% compounded weekly? What about the vig? Vigorish.

$$A = P\left(1+\frac{r}{m}\right)^{mt} \Rightarrow \frac{A}{\left(1+\frac{r}{m}\right)^{mt}} = \boxed{P = A\left(1+\frac{r}{m}\right)^{-mt}}$$

$$P = 1000\left(1+\frac{.085}{52}\right)^{-52\cdot 11} \approx \$3928.86$$

```
      9.496116342
ln(2)/365*ln(1+.
073/365)
   3.797686987E-7
1000*(1+.085/52)
^-(52*11)*10
      3928.856607
```

Because I used 1000 where I needed 10000. See?

Check:

$$3928\left(1+\frac{.085}{52}\right)^{52\cdot 11} \approx 10{,}000$$

```
   3.797686987E-7
1000*(1+.085/52)
^-(52*11)*10
      3928.856607
Ans*(1+.085/52)^
(52*11)
             10000
```

$\frac{(x+2)(x-1)^2}{(x-3)(x+2)(x+1)^2}$ $\frac{\deg 3}{\deg 4}$ is proper.

$y=0$ is horizontal asymptote.

Domain: $\{x \mid x \neq -2, -1, 3\}$

Vertical asymptotes:

$x=-1$

$x=3$

$x=-2$ is a HOLE.

$\frac{(x-1)^2}{(x-3)(x+1)^2}$ is in lowest terms.

Find hole: $\frac{(-2-1)^2}{(-2-3)(-2+1)^2} = \frac{9}{-5}$

$(-2, -\frac{9}{5})$

Zeros: $x=1$