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Question 1

```
syms x
(x-2)/(x^2-1)
```

```
ans =
```

$$\frac{x-2}{x^2-1}$$

```
[diff(x-2,x);diff(x^2-1,x);diff((x-2)/(x^2-1))]
```

```
ans =
```

$$\begin{pmatrix} 1 \\ 2\,x \\ \frac{1}{x^2-1}-\frac{2\,x\,(x-2)}{(x^2-1)^2} \end{pmatrix}$$

The Numerator of the derivative can be simplifed by combining like terms.

Question 2

```
syms x
(x^3 * 1/x)
```

```
ans =
```

$x^2$

```
[diff(x^3,x);diff(1/x,x);diff(x^3*(1/x),x)]
```

```
ans =
```

$$\begin{pmatrix} 3\,x^2 \\ -\frac{1}{x^2} \\ 2\,x \end{pmatrix}$$

You can find the derivative using the power rule where x^NUMBER = NUMBER*x^NUMBER-1

Question 3

```
syms x e
[diff(x^2,x);diff(e^x,x);(diff(x^2 + 3*x - 1,x));diff(x^2*e^x*(x^2 + 3*x - 1),x)]
```

```
ans =
```

$$\begin{pmatrix} 2\,x \\ e^x \log(e) \\ 2\,x+3 \\ 2\,e^x\,x\,(x^2+3\,x-1)+e^x\,x^2\,(2\,x+3)+e^x\,x^2\log(e)\,(x^2+3\,x-1) \end{pmatrix}$$

You Can find the derivative using the product rule.

Question 4

```
syms x
(x^3-2*x+1)/(x^2-1)
```

ans =

$$\frac{x^3-2\,x+1}{x^2-1}$$

```
[diff(x^3-2*x+1,x);diff(x^2-1,x);diff((x^3-2*x+1)/(x^2-1),x)]
```

ans =

$$\begin{pmatrix} 3\,x^2-2 \\ 2\,x \\ \frac{3\,x^2-2}{x^2-1}-\frac{2\,x\,(x^3-2\,x+1)}{(x^2-1)^2} \end{pmatrix}$$

Find the derivative using the quotiont rule

Queston 5

```
syms a b c d x
(a+b*c)/(c+d*x)
```

ans =

$$\frac{a+b\,c}{c+d\,x}$$

```
[diff(a+b*x,x);diff(c+d*x,x);diff((a+b*x)/(c+d*x),x)]
```

ans =

$$\begin{pmatrix} b \\ d \\ \frac{b}{c+d\,x}-\frac{d\,(a+b\,x)}{(c+d\,x)^2} \end{pmatrix}$$

You can find the derivative using the quotiont rule again.