

## Body nespojitosti funkcie, limita a derivácia funkcie

### Body nespojitosti

Určte body nespojitosti funkcie  $f(x) = \frac{1+x^3}{x^2-3x+2}$ .

```
> discont((1+x^3)/(x^2-3*x+2),x);  
{1,2}
```

### Výpočet limit

```
> b := Limit(7*sin(5*x)/x, x=0);
```

$$b := \lim_{x \rightarrow 0} 7 \frac{\sin(5x)}{x}$$

```
> b := limit(7*sin(5*x)/x, x=0);
```

$$b := 35$$

```
> b2 := Limit((x+2)/(x+3))^{5*x}, x=infinity);
```

$$b2 := \lim_{x \rightarrow \infty} \left( \frac{x+2}{x+3} \right)^{5x}$$

```
> b2 := limit((x+2)/(x+3))^{x*5}, x=infinity);
```

$$b2 := e^{(-5)}$$

```
> b3 := Limit((sqrt(2+x)-sqrt(2))/x, x=0);
```

$$b3 := \lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$$

```
> b3 := limit((sqrt(2+x)-sqrt(2))/x, x=0);
```

$$b3 := \frac{1}{4} \sqrt{2}$$

### Výpočet derivácie

```
> F(x) := sin(2*x)+[sin(x)]^2+sin(x^2);
```

$$F(x) := \sin(2x) + [\sin(x)]^2 + \sin(x^2)$$

```
Diff(sin(2*x)+[sin(x)]^2+sin(x^2),x)=diff(sin(2*x)+[sin(x)]^2+sin(x^2),x);
```

$$\frac{\partial}{\partial x} (\sin(2x) + [\sin(x)]^2 + \sin(x^2)) = 2 \cos(2x) + 2 [\sin(x)] [\cos(x)] + 2 \cos(x^2) x$$

```
> Diff(x*arcsin(x)+sqrt(1-x^2),x)=diff(x*arcsin(x)+sqrt(1-x^2),x);
```

$$\frac{\partial}{\partial x} (x \arcsin(x) + \sqrt{1-x^2}) = \arcsin(x)$$

```
> Diff(ln((5+4*x)/(3+7*x))+x*10^(-x),x)=diff(ln((5+4*x)/(3+7*x))+x*10^(-x),x);
```

$$\frac{\partial}{\partial x} \left( \ln \left( \frac{5+4x}{3+7x} \right) + x 10^{(-x)} \right) =$$

$$\frac{\left( 4 \frac{1}{3+7x} - \frac{7(5+4x)}{(3+7x)^2} \right) (3+7x)}{5+4x} + 10^{(-x)} - x 10^{(-x)} \ln(10)$$