

[201)

>  $f := x \rightarrow \frac{(x^2 + 1)}{\cos(x) + \text{Pi}}$

$$f := x \rightarrow \frac{x^2 + 1}{\cos(x) + \pi}$$

(1)

>  $f(0)$

$$\frac{1}{1 + \pi}$$

(2)

>  $f(a)$

$$\frac{a^2 + 1}{\cos(a) + \pi}$$

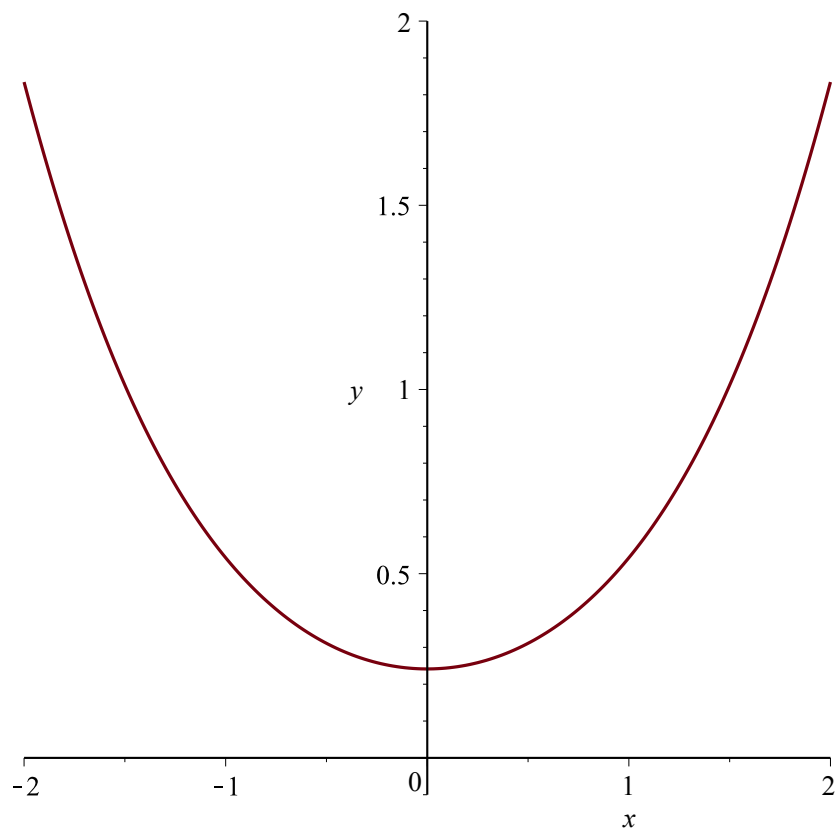
(3)

>  $f(0.5)$

$$\frac{1.25}{0.8775825619 + \pi}$$

(4)

>  $\text{plot}(f(x), x=-2..2, y=-0.1..2)$



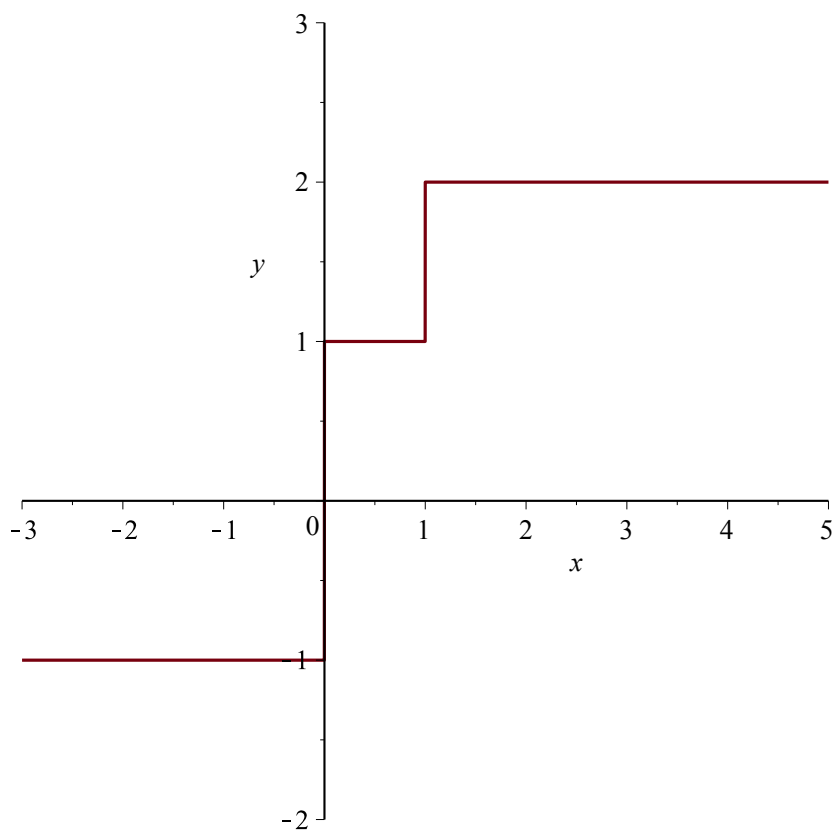
202)

>  $f := x \rightarrow \text{piecewise}(x < 0, -1, x < 1, 1, 2)$

$f := x \rightarrow \text{piecewise}(x < 0, -1, x < 1, 1, 2)$

(5)

>  $\text{plot}(f(x), x = -3 \dots 5, y = -2 \dots 3)$



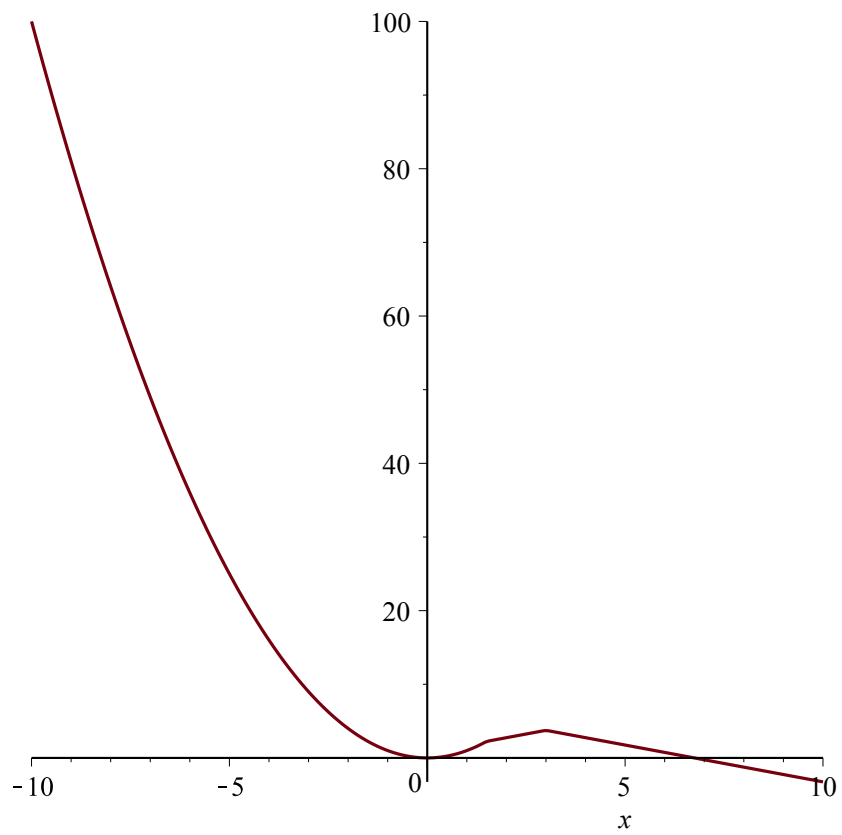
203)

>  $f := x \rightarrow \text{piecewise}(x < 1.5, x^2, x < 3, x + 0.75, 6.75 - x)$

$f := x \rightarrow \text{piecewise}(x < 1.5, x^2, x < 3, x + 0.75, 6.75 - x)$

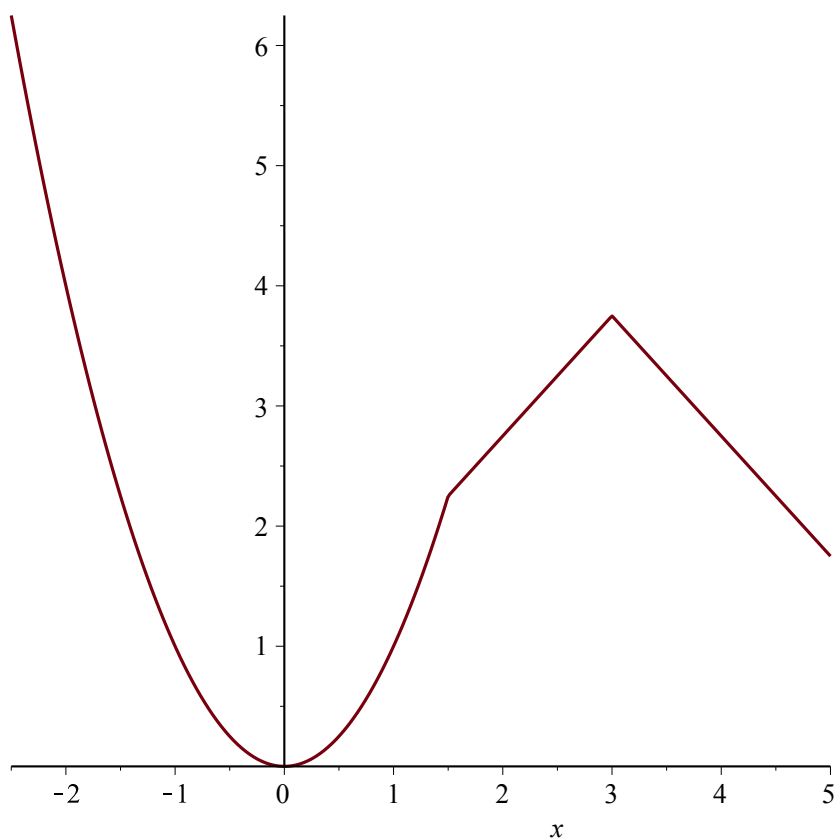
(6)

>  $\text{plot}(f(x))$



for better visibility of the points where the condition changes are the plot is redrawn with specified x-range

```
> plot(f(x), x=-2.5..5)
```



204)

**>**  $f := (x, y) \rightarrow \text{sqrt}(x^2 + y^2)$

$$f := (x, y) \rightarrow \sqrt{x^2 + y^2}$$

**(7)**

**>**  $f(3, 4)$

5

**(8)**

**>**  $f(0, -9)$

9

**(9)**

205)

**>**  $s := \text{sum}(k^2, k = 1 .. n)$

$$s := \frac{1}{3} (n + 1)^3 - \frac{1}{2} (n + 1)^2 + \frac{1}{6} n + \frac{1}{6}$$

**(10)**

**>**  $h := \text{unapply}(s, n)$

$$h := n \rightarrow \frac{1}{3} (n + 1)^3 - \frac{1}{2} (n + 1)^2 + \frac{1}{6} n + \frac{1}{6}$$

**(11)**

```
> h(5)
55 (12)
```

```
> h(6)
91 (13)
```

```
> h(7)
140 (14)
```

```
206)
```

```
a)
> f := x → 3 x4 - 7 x2 + 5
f := x → 3 x4 - 7 x2 + 5 (15)
```

```
> verify(f(x), f(-x), equal)
true (16)
```

```
> verify(f(x), -f(-x), equal)
FAIL (17)
```

```
=> even
```

```
b)
> f := x → 4 x3 - 3 x + sin(x)
f := x → 4 x3 - 3 x + sin(x) (18)
```

```
> verify(f(x), f(-x), equal)
FAIL (19)
```

```
> verify(f(x), -f(-x), equal)
true (20)
```

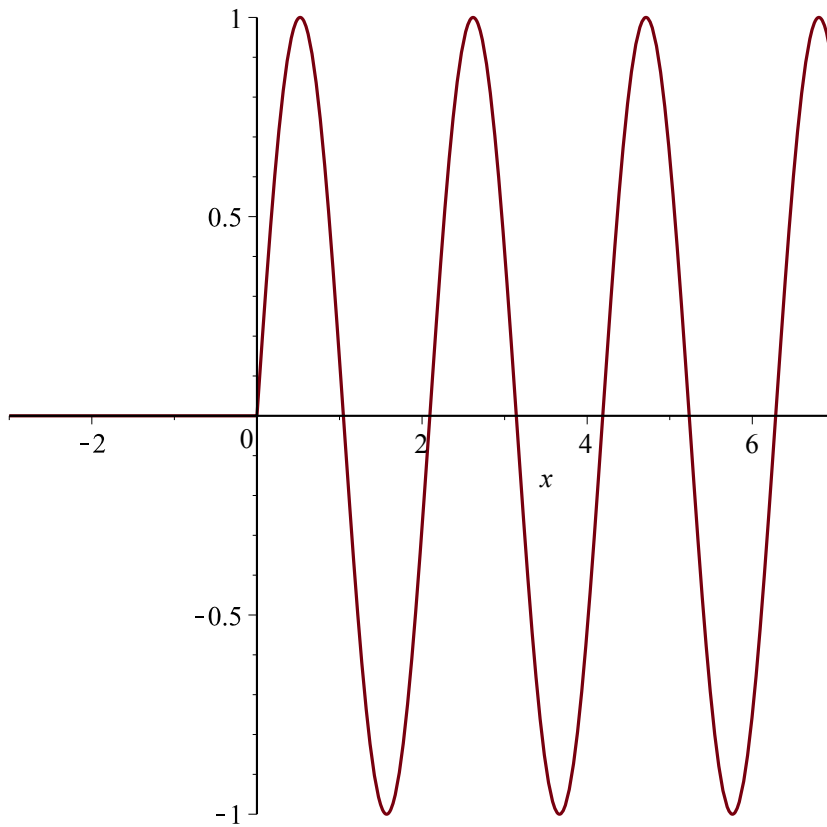
```
=> odd
```

```
207)
```

```
Definition with piecewise():
```

```
> f := x → piecewise(x < 0, 0, sin(3 x))
f := x → piecewise(x < 0, 0, sin(3 x)) (21)
```

```
> plot(f(x), x = -3 .. 7)
```



Definition as a product of a sine function and the Heaviside function:

>  $f := x \rightarrow \sin(3x) \cdot \text{Heaviside}(x)$

$f := x \rightarrow \sin(3x) \text{ Heaviside}(x)$

>  $\text{plot}(f(x), x = -3 .. 7)$

(22)

