PR NAPÍŠTE ROVNICU TEČNÝ A NORMÁLY KU KRIVKE

$y = x^2 + 3x - 2$ V BODE $T[1; ?]$.

$T[1, ?] \ldots \quad y = 1^2 + 3 \cdot 1 - 2 = 2 \quad \ldots \quad T[1; 2]$

TEČNA:

$$y - y_0 = k(x - x_0) \qquad k = y' = 2x + 3\Big|_{x_0 = 1} = 5$$

$$y - 2 = 5(x - 1)$$

$$y = 5x - 3$$

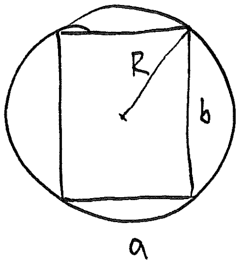
NORMÁLA:

$$-\frac{1}{k} = -\frac{1}{5}$$

$$y - 2 = -\frac{1}{5}(x - 1)$$

$$y = -\frac{x}{5} + \frac{9}{5}$$

PR DO ~~GULE~~ KRUHU O POLOMERE R VPÍŠTE OBDĹŽNIK MAXIMÁLNEHO OBVODU.



$$4R^2 = a^2 + b^2 \quad \Rightarrow b = \sqrt{4R^2 - a^2}$$

$$o = 2(a + b) = 2 \cdot \left(a + \sqrt{4R^2 - a^2}\right)$$

$$o' = 2 \cdot \left(1 - \frac{a}{\sqrt{4R^2 - a^2}}\right) = 0 \qquad \sqrt{4R^2 - a^2} - a = 0$$

$$a^2 = 2R^2$$

$$a = \pm\sqrt{2} \cdot R$$

$$b = \sqrt{2} \cdot R$$

OVERENIE:

$a \in (0; \sqrt{2}R) \ldots \sqrt{4R^2 - a^2} > \sqrt{2}R \ldots o' > 0$

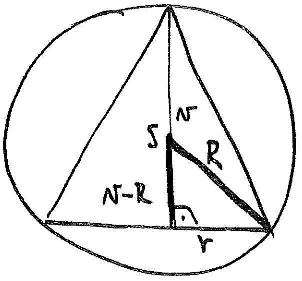
$a \in (\sqrt{2} \cdot R; 2R) \ldots \sqrt{4R^2 - a^2} < \sqrt{2} \cdot R \ldots o' < 0$

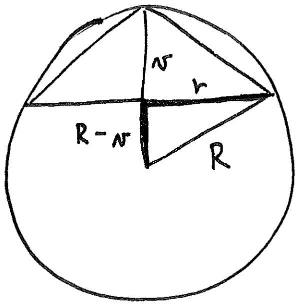
$a = \sqrt{2} \cdot R$

lokálne maximum

PR) DO GULE O POLOMERE R VPÍŠTE KUŽEL S NAJVÄČŠÍM OBJEMOM.

NÁKRES - PRIEREZ:





1. PRÍPAD: $v > R$

$$(v-R)^2 = R^2 - v^2$$

2. PRÍPAD: $v < R$

$$(R-v)^2 = R^2 - r^2$$

$$r = \sqrt{2vR - v^2}$$

OBJEM KUŽELA V ZÁVISLOSTI NA v:

$$V = \frac{1}{3}\pi r^2 v = \frac{1}{3}\pi v\left(2vR - v^2\right) = \frac{2}{3}\pi v^2 R - \frac{1}{3}\pi v^3$$

$$V_{max}\,[0, 2R] = V'(v) = \frac{4}{3}\pi v R - \pi v^2 = \pi v\left(\frac{4}{3}R - v\right)$$

$$V(v) = 0 \quad \dots\dots \quad v_0 = 0 \quad \dots \text{ MINIMUM}$$

$$v_0 = \frac{4}{3}R \quad \dots \text{ MAXIMUM}$$

OBJEM KUŽELA ... $r_0 = \sqrt{\frac{8}{3}R^2 - \frac{16}{9}R^2} = \frac{\sqrt{8}}{3}R$

$$V_{max} = \frac{1}{3}\pi r_0^2 v_0 = \frac{32}{81}\pi R^3$$