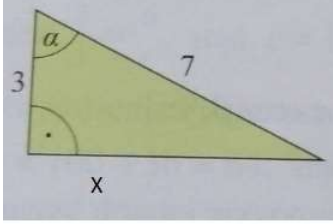
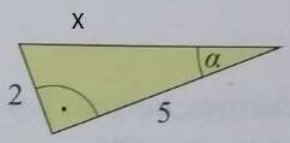
. Oblicz wartości funkcji trygonometrycznych kąta α zaznaczonego na rysunku.

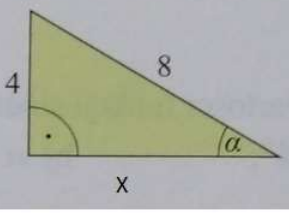
a)



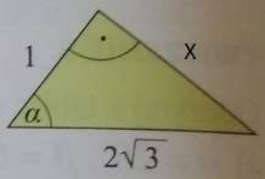
b)



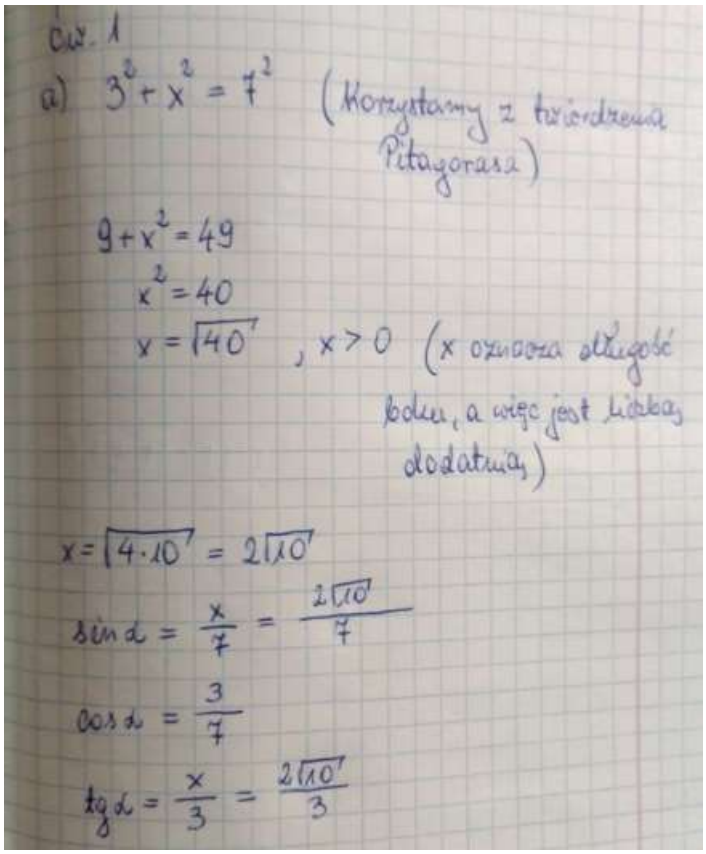
c)



d)



a



Ćw. 1

a) $3^2 + x^2 = 7^2$ (Korzystamy z twierdzenia Pitagorasa)

$9 + x^2 = 49$

$x^2 = 40$

$x = \sqrt{40}$, $x > 0$ (x oznacza długość boku, a więc jest liczbą dodatnią)

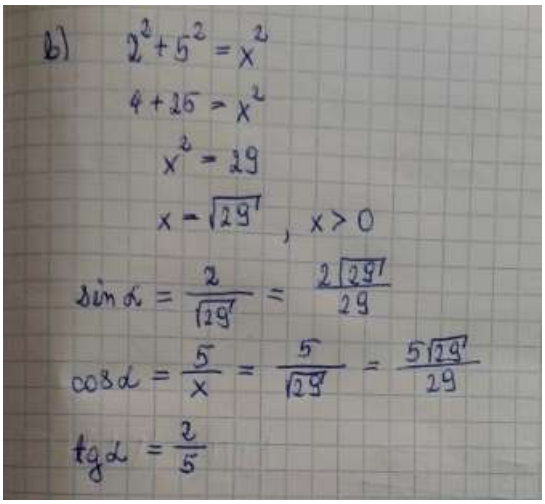
$x = \sqrt{4 \cdot 10} = 2\sqrt{10}$

$\sin\alpha = \frac{x}{7} = \frac{2\sqrt{10}}{7}$

$\cos\alpha = \frac{3}{7}$

$\operatorname{tg}\alpha = \frac{x}{3} = \frac{2\sqrt{10}}{3}$

b



b) $2^2 + 5^2 = x^2$

$4 + 25 = x^2$

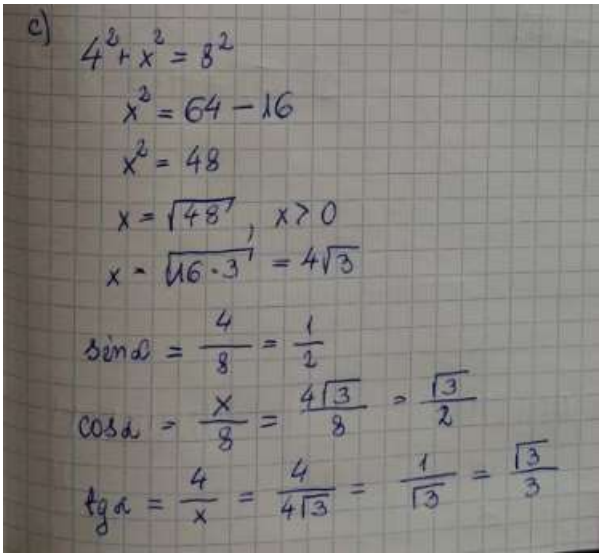
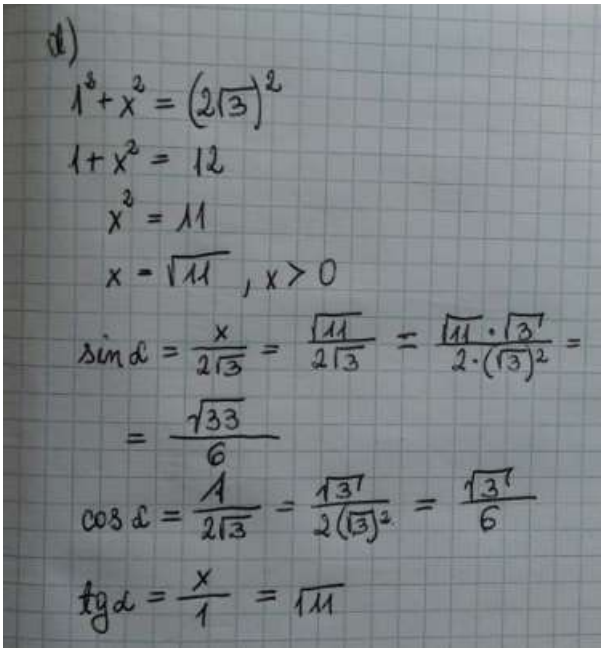
$x^2 = 29$

$x = \sqrt{29}$, $x > 0$

$\sin\alpha = \frac{2}{\sqrt{29}} = \frac{2\sqrt{29}}{29}$

$\cos\alpha = \frac{5}{x} = \frac{5}{\sqrt{29}} = \frac{5\sqrt{29}}{29}$

$\operatorname{tg}\alpha = \frac{2}{5}$

c	
d	

c)
$4^2 + x^2 = 8^2$
$x^2 = 64 - 16$
$x^2 = 48$
$x = \sqrt{48}$, $x > 0$
$x = \sqrt{16 \cdot 3} = 4\sqrt{3}$
$\sin\alpha = \frac{4}{8} = \frac{1}{2}$
$\cos\alpha = \frac{x}{8} = \frac{4\sqrt{3}}{8} = \frac{\sqrt{3}}{2}$
$\operatorname{tg}\alpha = \frac{4}{x} = \frac{4}{4\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

d)
$1^2 + x^2 = (2\sqrt{3})^2$
$1 + x^2 = 12$
$x^2 = 11$
$x = \sqrt{11}$, $x > 0$
$\sin\alpha = \frac{x}{2\sqrt{3}} = \frac{\sqrt{11}}{2\sqrt{3}} = \frac{\sqrt{11} \cdot \sqrt{3}}{2 \cdot (\sqrt{3})^2} =$
$= \frac{\sqrt{33}}{6}$
$\cos\alpha = \frac{1}{2\sqrt{3}} = \frac{\sqrt{3}}{2(\sqrt{3})^2} = \frac{\sqrt{3}}{6}$
$\operatorname{tg}\alpha = \frac{x}{1} = \sqrt{11}$