Zadaci 2.4.

KORISTIMO PRAVILA:

$$\sin^2 x+\cos^2 x=1$$

$$\operatorname{tg} x=\frac{\sin x}{\cos x}$$

$$\operatorname{ctg} x=\frac{\cos x}{\sin x}$$

1) $1-\cos^2 x=\sin^2 x+\cos^2 x-\cos^2 x=$

$=\sin^2 x$

2) $\sin^2 x-1=\sin^2 x-\left(\sin^2 x+x+\cos^2 x\right)=$

$=\sin^2 x-\sin^2 x-\cos^2 x=$

$=-\cos^2 x$

3) $2\sin^2 x+\cos^2 x-2=2\sin^2 x+\cos^2 x-2\cdot 1=$

$=2\sin^2 x+\cos^2 x-2\cdot\left(\sin^2 x+\cos^2 x\right)=$

$=2\sin^2 x+\cos^2 x-2\sin^2 x-2\cos^2 x=$

$=2\sin^2 x-2\sin^2 x+\cos^2 x-2\cos^2 x=$

$=-\cos^2 x$

4) $\sin^4 x-\cos^4 x+\cos^2 x=\left(\sin^2 x-\cos^2 x\right)\underbrace{\left(\sin^2+\cos^2 x\right)}_{=1}+\cos^2 x=$

$=\left(\sin^2 x-\cos^2 x\right)\cdot 1+\cos^2 x=$

$=\sin^2 x-\cos^2 x+\cos^2 x=$

$=\sin^2 x$

5) $2-\sin^2 x-\cos^2 x=2\cdot 1-\sin^2 x-\cos^2 x=$

$=2\cdot\left(\sin^2 x+\cos^2 x\right)-\sin^2 x-\cos^2 x=$

$=2\sin^2 x+2\cos^2 x-\sin^2 x-\cos^2 x=$

$=2\sin^2 x-\sin^2 x+2\cos^2 x-\cos^2 x=$

$=\sin^2 x+\cos^2 x=$

$=1$

6) $\operatorname{tg}^2 x-\sin^2 x=\operatorname{tg}^2 x\cdot\sin^2 x$

$$\frac{\sin^2 x}{\cos^2 x}-\sin^2 x=\operatorname{tg}^2 x\cdot\sin^2 x$$

$$\frac{\sin^2-\sin^2 x\cdot\cos^2 x}{\cos^2 x}=\operatorname{tg}^2 x\cdot\sin^2 x$$

$$\frac{\sin^2 x\left(1-\cos^2 x\right)}{\cos^2 x}=\operatorname{tg}^2 x\cdot\sin^2 x$$

$$\frac{\sin^2 x}{\cos^2 x}\cdot\left(1-\cos^2 x\right)=\operatorname{tg}^2 x\cdot\sin^2 x$$

$$\operatorname{tg}^2 x\cdot\left(\sin^2 x+\cos^2 x-\cos^2 x\right)=\operatorname{tg}^2 x\cdot\sin^2 x$$

$$\operatorname{tg}^2 x\cdot\sin^2 x=\operatorname{tg}^2 x\cdot\sin^2 x$$

Zadatke riješio: Mladen Sraga
www.mim-sraga.com

7) $\operatorname{ctg}^2 x-\cos^2 x=\operatorname{ctg}^2 x\cdot\cos^2 x$

$$\frac{\cos^2 x}{\sin^2 x}-\cos^2 x=\operatorname{ctg}^2 x\cdot\cos^2 x$$

$$\cos^2 x\cdot\left(\frac{1}{\sin^2 x}-1\right)=\operatorname{ctg}^2 x\cdot\cos^2 x$$

$$\cos^2 x\cdot\frac{1-\sin^2 x}{\sin^2}=\operatorname{ctg}^2 x\cdot\cos^2 x$$

$$\cos^2 x\cdot\frac{\sin^2 x+\cos^2 x-\sin^2 x}{\sin^2 x}=\operatorname{ctg}^2 x\cdot\cos^2 x$$

$$\cos^2 x\cdot\frac{\cos^2 x}{\sin^2 x}=\operatorname{ctg}^2 x\cdot\cos^2 x$$

$$\cos^2 x\cdot\operatorname{ctg}^2 x=\operatorname{ctg}^2 x\cdot\cos^2 x$$

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8) $(1-\sin x)(1+\sin x)=1^2-\sin^2 x=$

$$=1-\sin^2 x=$$

$$=\sin^2 x+\cos^2 x-\sin^2 x=$$

$$=\cos^2 x+\sin^2 x-\sin^2 x=$$

$$=\cos^2 x$$

2.

1) $$\frac{1-\sin^2 x}{\cos^2 x-1}=\frac{\sin^2 x+\cos^2 x-\sin^2 x}{\cos^2 x-\left(\sin^2 x+\cos^2 x\right)}=$$

$$=\frac{\cos^2 x}{\cos^2 x-\sin^2 x-\cos^2 x}=$$

$$=\frac{\cos^2 x}{-\sin^2 x}=$$

$$=-\frac{\cos^2 x}{\sin^2 x}=-\operatorname{ctg}^2 x$$

2) $$(1+\operatorname{tg}^2 x)\cdot\cos^2 x=\left(1+\frac{\sin^2 x}{\cos^2 x}\right)\cdot\cos^2 x=$$

$$=\frac{\cos^2 x+\sin^2 x}{\cos^2 x}\cdot\cos^2 x=$$

$$=\frac{\sin^2 x+\cos^2 x}{\cancel{\cos^2 x}}\cdot\frac{\cancel{\cos^2 x}}{1}=\sin^2 x+\cos^2 x=1$$

2.

1) $$\frac{1-\sin^2 x}{\cos^2 x-1}=\frac{\sin^2 x+\cos^2 x-\sin^2 x}{\cos^2 x-\left(\sin^2 x+\cos^2 x\right)}=$$
$$=\frac{\cos^2 x}{\cos^2 x-\sin^2 x-\cos^2 x}=$$
$$=\frac{\cos^2 x}{-\sin^2 x}=$$
$$=-\frac{\cos^2 x}{\sin^2 x}=-\operatorname{ctg}^2 x$$

KORISTIMO PRAVILA:

$$\sin^2 x+\cos^2 x=1$$
$$\operatorname{tg} x=\frac{\sin x}{\cos x}$$
$$\operatorname{ctg} x=\frac{\cos x}{\sin x}$$
$$\operatorname{tg}^2 x=\frac{\sin^2 x}{\cos^2 x}$$
$$\operatorname{ctg}^2 x=\frac{\cos^2 x}{\sin^2 x}$$

2) $$\left(1+\operatorname{tg}^2 x\right)\cdot\cos^2 x=\left(1+\frac{\sin^2 x}{\cos^2 x}\right)\cdot\cos^2 x=$$
$$=\frac{\cos^2 x+\sin^2 x}{\cos^2 x}\cdot\cos^2 x=$$
$$=\frac{\sin^2 x+\cos^2 x}{\cancel{\cos^2 x}}\cdot\frac{\cancel{\cos^2 x}}{1}=\sin^2 x+\cos^2 x=1$$

3) $$\frac{\cos^2 x}{1-\cos^2 x}\cdot\operatorname{tg}^2 x=\frac{\cos^2 x}{\sin^2 x+\cos^2 x-\cos^2 x}\cdot\frac{\sin^2 x}{\cos^2 x}=$$
$$=\frac{\cos^2 x}{\sin^2 x}\cdot\frac{\sin^2 x}{\cos^2 x}=$$
$$=\frac{\cancel{\cos^2 x}}{\cancel{\sin^2 x}}\cdot\frac{\cancel{\sin^2 x}}{\cancel{\cos^2 x}}=1$$

4) $$\frac{\sin^3 x+\cos^3 x}{1-\sin x\cdot\cos x}=\sin x+\cos x$$

$$\frac{\sin^3 x+\cos^3 x}{1-\sin x\cdot\cos x}=\ =\sin x+\cos x \qquad a^3+b^3=(a+b)\left(a^2-ab+b^2\right)$$

$$\frac{\left(\sin x+\cos x\right)\cdot\left(\sin^2 x-\sin x\cdot\cos x+\cos^2 x\right)}{1-\sin x\cdot\cos x}=\sin x+\cos x$$

$$\frac{\left(\sin x+\cos x\right)\cdot\left(\sin^2 x+\cos^2 x-\sin x\cdot\cos x\right)}{1-\sin x\cdot\cos x}=\sin x+\cos x$$

$$\frac{\left(\sin x+\cos x\right)\cdot\left(1-\sin x\cdot\cos x\right)}{\left(1-\sin x\cdot\cos x\right)}=\sin x+\cos x$$

$$\sin x+\cos x=\sin x+\cos x$$

2.

5) $$\frac{1+\operatorname{tg} x+\operatorname{tg}^2 x}{1+\operatorname{ctg} x+\operatorname{ctg}^2 x}=\operatorname{tg}^2 x$$

$$\frac{1+\dfrac{\sin x}{\cos x}+\dfrac{\sin^2 x}{\cos^2 x}}{1+\dfrac{\cos x}{\sin x}+\dfrac{\cos^2 x}{\sin^2 x}}=\operatorname{tg}^2 x$$

$$\frac{\dfrac{\cos^2+\cos x\cdot\sin x+\sin^2 x}{\cos^2 x}}{\dfrac{\sin^2 x+\sin x\cdot\cos x+\cos^2 x}{\sin^2 x}}=\operatorname{tg}^2 x$$

$$\frac{\dfrac{\cancel{\left(\cos^2+\cos x\cdot\sin x+\sin^2 x\right)}}{\cos^2 x}}{\dfrac{\cancel{\left(\sin^2 x+\sin x\cdot\cos x+\cos^2 x\right)}}{\sin^2 x}}=\operatorname{tg}^2 x$$

$$\frac{\dfrac{1}{\cos^2 x}}{\dfrac{1}{\sin^2 x}}=\operatorname{tg}^2 x$$

$$\frac{\sin^2 x}{\cos^2 x}=\operatorname{tg}^2 x$$

$$\operatorname{tg}^2 x=\operatorname{tg}^2 x$$

ili ovako:

$$\frac{1+\operatorname{tg} x+\operatorname{tg}^2 x}{1+\operatorname{ctg} x+\operatorname{ctg}^2 x}=\frac{1+\dfrac{\sin x}{\cos x}+\dfrac{\sin^2 x}{\cos^2 x}}{1+\dfrac{\cos x}{\sin x}+\dfrac{\cos^2 x}{\sin^2 x}}=\frac{\dfrac{\cos^2+\cos x\cdot\sin x+\sin^2 x}{\cos^2 x}}{\dfrac{\sin^2 x+\sin x\cdot\cos x+\cos^2 x}{\sin^2 x}}=$$

$$=\frac{\dfrac{\cancel{\left(\cos^2+\cos x\cdot\sin x+\sin^2 x\right)}}{\cos^2 x}}{\dfrac{\cancel{\left(\sin^2 x+\sin x\cdot\cos x+\cos^2 x\right)}}{\sin^2 x}}=\frac{\dfrac{1}{\cos^2 x}}{\dfrac{1}{\sin^2 x}}=\frac{\sin^2 x}{\cos^2 x}=\operatorname{tg}^2 x$$

uskoro još
potpuno riješenih zadatak iz školske zbirke
možete očekivati na ovim stranicama !!!!!!