20.04.20

№ 7.1.65

$x^3+y^3=\sin(x-2y)$, $y'-?$

$(x^3+y^3)'_x=(\sin(x-2y))'_x$

$(x^3)'_x+(y^3)'_x=\cos(x-2y)(x-2y)'_x$

$3x^2+3y^2\cdot y'=\cos(x-2y)(x-2y)'_x$

$3y^2y'+2y'\cos(x-2y)=\cos(x-2y)-3x^2$

$y'(3y^2+\cos(x-2y))=\cos(x-2y)-3x^2$

$y'=\frac{\cos(x-2y)-3x^2}{3y^2+2\cos(x-2y)}$

№ 7.1.72

$x=2\cos t$, $y=3\sin t$, $y'(x)=?$

$y'(x)=\frac{y'(t)}{x'(t)}=\frac{(3\sin t)'_t}{(2\cos t)'_t}=\frac{3\cos t}{-2\sin t}=-\frac{3}{2}\operatorname{ctg} t$

№ 7.1.83

1) $f(x)=\sin(3x)$, $f'''(x)-?$

$f'(x)=(\sin 3x)'=\cos 3x\cdot(3x)'=3\cos 3x$

$f''(x)=(f')'_x=(3\cos 3x)'_x=-9\sin 3x$

$f'''(x)=-27\cos 3x$

2) $x=t^2$, $y=t^3$, $y=y(x)$, $y''_{xx}-?$

$y''_{xx}=\frac{x'_t\cdot y''_{tt}-y'_t\cdot x''_{tt}}{(x'_t)^3}=\frac{(t^2)'((t^3)')'-(t^3)'((t^2)')'}{((t^2)')^3}=\frac{2t\cdot 6t-3t^2\cdot 2}{8t^3}=$

$=\frac{12t^2-6t^2}{8t^3}=\frac{6}{8t}=\frac{3}{4t}$