A MATHS SELF TEST - with answers

1

$(a+b)\cdot(a-b)=a^2+b^2$	-
$(a+b)\cdot(b-a)=a^2-b^2$	-
$(-a-b)^2=a^2+b^2+2\cdot a\cdot b$	X

2

$\log(a\cdot b)=\log(a)\cdot\log(b)$	-
$\log(e^x)=x\cdot\log(e)$	X
$\ln(2^{x+2})=x+2\cdot\ln(2)$	-

3

$\frac{\ln(7)}{\ln(8)}=\frac{7}{8}$	-
$\log(1)=0$	X
$\log(5)=10^5$	-

4

$(\sqrt{1+x})^2=1+x$	X
$(\sqrt{1+x})^2=1+x^2+2x$	-
$\sqrt{(1+x)^2}=1+x$	-

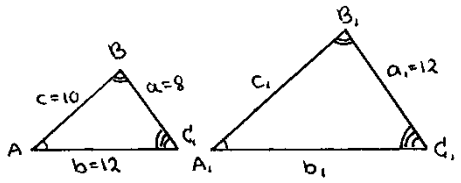
5

You can multiply a fraction by a number by multiplying the numerator and the denominator by the number	-
You can multiply a fraction with a fraction by multiplying with the inverse fraction	-
Dividing the numerator and the denominator with the same number $(\neq 0)$ doesn´t change a fraction	X

6

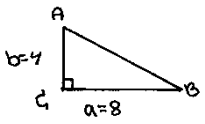
$\frac{b+b+b+b}{b+b+b}=b$	-
$\frac{a+b}{a-b}=\frac{-a-b}{b-a}$	X
$\frac{a^5\cdot a^3\cdot a^{-2}}{(a^2)^3}=a$	-

7



$c_1=14 \wedge b_1=16$	-
$c_1=15 \wedge b_1=18$	X
$c_1=15 \vee b_1=18$	-

8



The length of the hypotenuse is 12	-
The length of the hypotenuse is $\sqrt{12}$	-
The length of the hypotenuse is $\sqrt{80}$	X

9

$$y=k\cdot x \qquad k\neq 0$$

x og y are proportional	X
x og y are inversely proportional	-
x og y are linear dependent	X

10

$$f(x)=8\cdot a^x \text{ og } T_2=3$$

$f(0)=8$ og $f(6)=32$	X
$f(0)=0$ og $f(1)=8$	-
$f(3)=16$ og $f(-3)=4$	X

Write a "+" for a correct answer/statement and a " - " for a wrong one in the corresponding small boxes to the right

11

$c \cdot d = 0$ means that either c or d equals 0, or that they both equal 0.	X
It is forbidden to multiply an equation by 0.	X
Squaring an expression means taking the square root.	-

12

$-(-1)^4 \cdot (-1) \cdot (-1)^3 \cdot 1 = 1$	-
$2 \cdot 3^{2x} = 2 \cdot 9^x$	X
$2 \cdot 3^x = 6^x$	-
$\sqrt[3]{-8} + 4 \cdot 2^{-2} = -1$	X

13

The range of a logarithm function is the set of all real numbers.	X
The domain of a logarithm function is the set of all real numbers.	-
$f : f(x) = x^2 - 17x - 50$ has a global minimum	X

14

$(\ln(x))' = \frac{1}{x}$	X
$(e^{3x})' = e^{3x}$	-
$(\frac{1}{x})' = \frac{1}{x^2}$	-

15

$$\lim_{x \to \infty} \frac{1}{x^2} =$$

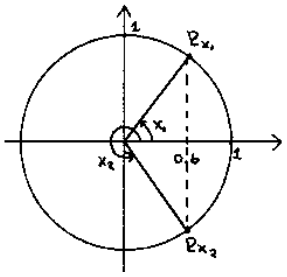
0	X
∞	-
1	-

16

$f'(x)$ is equal to

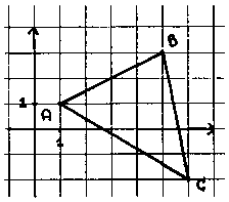
y'	X
$\frac{dy}{dx}$	X
$\int f(x)\,dx$	-

17



$\cos(x_2) = 0{,}6$	X
$\tan(x_1) = \tan(x_2) = 0{,}6$	-
$\sin(2\pi + x_2) = 0{,}6$	-
$\cos(x_1 - 2\pi) = 0{,}6$	X

18



$\vec{AB} + \vec{BC} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$	X
$\vec{BA} + \vec{AC} = -\vec{CB}$	X
$\lvert\vec{AB}\rvert + \lvert\vec{BC}\rvert = \lvert\vec{AC}\rvert$	-

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19

An equation of a line in a plane can be determined using:

a point on the line and a direction vector of the line	X
a point on the line and a normal vector of the line	X
2 points on the line	X

20

For 2 perpendicular lines in a plane it is known that

the determinant of their direction vectors is 0	-
the dot product of their direction vectors is 0	X
the dot product of their normal vectors is 0	X
the determinant of their normal vectors is 0	-

21

A plane α is given by $2x-3y+4z+8=0$.

$\begin{pmatrix}-4\\6\\-8\end{pmatrix}$ is a normal vector of the plane	X
$P(7,0,-\frac{11}{2}) \in \alpha$	X
The plane intersects the z-axis in $(-1,2,0)$	-

22

Calculating an angle between 2 planes can be done by

calculating an angle between 2 direction vectors of the planes	-
calculating an angle between 2 normal vectors of the planes	X
calculating the determinant between 2 normal vectors of the planes	-

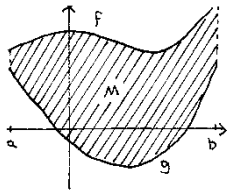
23

A parametrization of a line in space can be determined by use of:

a point on the line and a direction vector of the line	X
a point on the line and a normal vector of the line	-
2 points on the line	X

24

The area of M equals:



$[F(x)-G(x)]_a^b$	X
$-\int_b^a (f(x)-g(x))\,dx$	X
$[f(x)-g(x)]_a^b$	-

25

$\int (x^3-\sin(x)+e^{2x})\,dx = 3x^2-\cos(x)+2e^{2x}$	-
$\int (\frac{1}{x}-\sin(x)+2)\,dx = \ln\lvert x\rvert+\cos(x)+2x+c$	X
$\int \frac{4x^2-3x}{x}\,dx = 2x^2-3x+c$	X

26

$f(x)=3\cdot e^{-x}$ is

the general solution of the differential equation $y'=-y$	-
a particular solution of the differential equation $y'=-y$	X
not a solution of the differential equation $y'=-y$	-

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