## Formula sheet for the national test in mathematics, year 9

## PREFIXES

| T | G | M | k | h | da | d | c | m | $\mu$ | n | p |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| tera | giga | mega | kilo | hecto | deca | deci | centi | milli | micro | nano | pico |
| $10^{12}$ | $10^{9}$ | $10^{6}$ | $10^{3}$ | $10^{2}$ | $10^{1}$ | $10^{-1}$ | $10^{-2}$ | $10^{-3}$ | $10^{-6}$ | $10^{-9}$ | $10^{-12}$ |

## EXPONENTS

For all numbers $x$ and $y$ and positive numbers $a$
$a^{x} \cdot a^{y}=a^{x+y}$
$\frac{a^{x}}{a^{y}}=a^{x-y}$
$\left(a^{x}\right)^{y}=a^{x \cdot y}$
$a^{-x}=\frac{1}{a^{x}}$
$a^{0}=1$

## FUNCTIONS

Equation of a straight line $y=k x+m$

## GEOMETRY

| Triangle $A=\frac{b \cdot h}{2}$ |
| :--- |
| Parallelogram |
| Parallel trapezium |
| Circle $A=\frac{h(a+b)}{2}$ |
|  |

$$
A=\frac{v}{360^{\circ}} \cdot \pi \cdot r^{2}
$$

Circle sector

$$
b_{l}=\frac{v}{360^{\circ}} \cdot 2 \cdot \pi \cdot r
$$



## Cuboid <br> $V=B \cdot h$



Prism
$V=B \cdot h$


| Cylinder | $V=B \cdot h$ |
| :--- | :--- |
| Right circular | Lateral surface area |
| $A_{m}=2 \cdot \pi \cdot r \cdot h$ |  |

Cone
Right circular
$V=\frac{B \cdot h}{3}$
Lateral surface area
$A_{m}=\pi \cdot r \cdot s$

$\qquad$

Sphere
$V=\frac{4 \cdot \pi \cdot r^{3}}{3}$
$A=4 \cdot \pi \cdot r^{2}$


| Scale | area scale factor $=(\text { length scale factor })^{2}$ <br> volume scale factor $=(\text { length scale factor })^{3}$ |
| :--- | :--- |

Pythagoras theorem $\quad a^{2}+b^{2}=c^{2}$


