1) Simplify $\sqrt{98}$
2) A car bought for $£ 23,500$ depreciates in value by $7.5 \%$ per annum. Write a formula for the value of the car $V$, after $t$ years
3) Use the formula $s=\frac{1}{2}(u+v) t$ to find how long it took to travel 45 m if the initial velocity was $8 \mathrm{~m} / \mathrm{s}$ and the final velocity was $10 \mathrm{~m} / \mathrm{s}$
4) Evaluate $9^{\frac{5}{2}}$ (i.e 9 to the power of $\frac{5}{2}$ )
5) A block has a volume of $4 \mathrm{~m}^{3}$ and a mass of 32 kg . Calculate the density.
6) Find the nth term of the quadratic sequence $6,22,48,84, \ldots$
7) Sketch the curve $y=x^{3}$
8) Find the equation of the line with gradient $-\frac{1}{2}$ passing through the point ( 3,5 )
9) Work out $3.5 \times 10^{4}+5 \times 10^{3}$
10) Express $x^{2}-12 x-30$ in completed square form

## HAA2.5

1) Simplify $\sqrt{75}+\sqrt{12}$
2) Find the coordinates of the vertex of the graph

$$
y=x^{2}-6 x+10
$$

3) Use the formula $v^{2}=u^{2}+2 a s$ to find the initial velocity, if, after 7 m , the final velocity was $9 \mathrm{~m} / \mathrm{s}$, the acceleration was $4 \mathrm{~m} / \mathrm{s}^{2}$
4) Expand and simplify $(x-4)^{3}$
5) What is the exact value of $\cos 60^{\circ}$
6) A force of 420 N acts over an area of $60 \mathrm{~m}^{2}$. What is the pressure?
7) If $f(x)=3 x-2 x^{2}$, find the value of $f(3)$
8) If the nth term of a sequence is $\frac{4-2 n}{n^{2}}$, write down the first three terms
9) Work out $6 \times 10^{5} \times 6 \times 10^{8}$, giving your answer in standard form
10) Solve simultaneously $2 x-3 y=10$ and $8 x+y=1$
11) Simplify $2 \sqrt{45} \times 3 \sqrt{20}$
12) Find the nth term of $\frac{7}{1}, \frac{5}{8}, \frac{3}{27}, \frac{1}{64}$
13) Solve $\tan (x)=\sqrt{3}$ for $0^{\circ} \leq x<360^{\circ}$
14) Find the inverse function of $f(x)=4-\frac{x}{3}$
15) Find the next term in the sequence $\frac{4}{3}, 4,12,36, \ldots$
16) Find the equation of the line passing through $(4,7)$ and $(1,13)$
17) Solve using the quadratic formula (and a calculator), $3.2 x^{2}-2.8 x-7.3=0$
18) Factorise $6 x^{2}-x-15$
19) Simplify $\frac{3 x+2}{3}-\frac{4-3 x}{5}$
20) Write down the first three terms of the sequence defined by:
$x_{1}=2, x_{n+1}=2 x_{n}+1$
21) Expand $(x+3)(x-2)^{2}$
22) $\quad a$ is directly proportional to $b$. When $a=5, b=10$. Find the value of $b$ when $a=7$
23) Simplify $\frac{x^{2}-25}{x+5}$
24) If $f(x)=3-2 x^{2}$, find the value of $f(-5)$
25) Find the coordinates of the vertex of the graph
$y=x^{2}-6 x+12$
26) Find the equation of the line parallel to $3 y+6 x=5$ passing through the point ( $4,-3$ )
27) Simplify $\frac{2 x-5}{3}-\frac{2 x-4}{6}$
28) Sketch the graph of $y=x^{3}$
29) A pressure of $24 \mathrm{~N} / \mathrm{m}^{2}$ results from a force of 12 N acting over an area $x \mathrm{~m}^{2}$. Find $x$
30) Rationalise the denominator

$$
\frac{6 \sqrt{7}}{\sqrt{7}-1}
$$

1) Solve simultaneously $3 x+4 y=14$ and $x+6 y=7$
2) One solution of $\sin x=-0.342020 \ldots$ is $x=200^{\circ}$ What is the other solution in the range $0^{\circ} \leq x<360^{\circ}$ ?
3) Find the $100^{\text {th }}$ term of the sequences $46,52,58,64, \ldots$
4) Find $f g(x)$ where $f(x)=3 x+8$ and $g(x)=x^{2}-6$
5) $\operatorname{Simplify} \frac{2}{x+3}-\frac{5}{x}$
6) Shape $B$ is an enlargement of shape $A$ with scale factor 3 . If the area of shape $A$ is $36 \mathrm{~cm}^{2}$, what is the area of shape $B$ ?
7) Work out $\left(3.2 \times 10^{9}\right) \div\left(4 \times 10^{4}\right)$, giving your answer in standard form
8) Solve using the quadratic formula (and a calculator) $1.2 x^{2}+3.4 x=0$
9) Evaluate $4^{-2}$ and $4^{-\frac{1}{2}}$
10) The value of $x$ is given as 400 rounded to $\mathbf{2}$ significant figures. State the upper and lower bounds
11) Expand and simplify $\left(2 x^{2}-3 x+4\right)(5 x-6)$
12) If $f(x)=\frac{4-2 x}{5}$ find $f^{-1}(x)$
13) Find the equation of the line parallel to $2 y=3 x+8$ passing through the point $(6,1)$
14) Find the nth term of the sequence $19,16,11,4,-5, \ldots$
15) A car travels 40 km in 25 minutes, what is its average speed in $\mathrm{km} / \mathrm{h}$ ?
16) $t$ is given as 0.65 correct to two significant figures. Write an inequality to show the range of values $t$ could be
17) Shape $B$ is an enlargement of shape $A$ with scale factor 5 . If the volume of shape $A$ is $2 \mathrm{~cm}^{3}$, what is the volume of shape $B$ ?
18) Solve, by factorising, $6 x^{2}+17 x+12=0$
19) Expand and simplify $(4-2 \sqrt{3})(4+2 \sqrt{3})$
20) Sketch the graph of $y=-x^{2}$ and $y=-x^{3}$
