HAA1.1

1) Simplify $\sqrt{405}$

2) A car bought for £22000 depreciates in value by 4.3% each year. Write down 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 the distance travelled in 10 seconds if the initial velocity was 5m/s, and the final velocity was 12m/s.

4) Evaluate $16^{\frac{3}{4}}$ (i.e 16 to the power of ¾)

5) A block has a mass of 300g and a density of 75g/cm³. Calculate the volume.

HAA1.2

1) Find the nth term of the quadratic sequence 6, 18, 38, 66, …

2) Sketch the curve $y = \sin x$

3) Find the equation of the line with gradient 3 passing through the point (5, 10)

4) Work out $2.4 \times 10^3 + 4.1 \times 10^4$

5) Express $x^2 - 8x + 30$ in completed square form

HAA2.1

1) Simplify $\sqrt{125} + 3\sqrt{5}$

2) Find the coordinates of the vertex of the graph

$y = x^2 - 8x + 24$

3) Use the formula $v = u + at$ to find the final velocity when the initial velocity is 10m/s, the acceleration is -3m/s² and the time is 4s

4) Expand and simplify $(x + 2)(x - 3)(x + 4)$

5) What is the exact value of sin 30°

HAA2.2

1) A pressure of 30N/m² results from a force of 240N acting over an area x m². Find x

2) If $f(x) = 10 - 3x^2$, find the value of $f(-2)$

3) If the nth term of a sequence is $\frac{3n}{4n-2}$, write down the first three terms

4) Work out $6 \times 10^2 \times 3 \times 10^4$, giving your answer in standard form

5) Solve simultaneously $7x - 5y = 40$ and $2x - 5y = 15$

HAA3.1

1) Simplify $2\sqrt{3} \times 4\sqrt{75}$

2) Find the nth term of $\frac{3}{7}, \frac{4}{9}, \frac{5}{11}, \frac{6}{13}$

3) Solve $sin\, x = 0.5$ for $0° \leq x < 360°$

4) Find the inverse function of $f(x) = 3x + 2$

5) Find the next term in the sequence 2, 6, 18, 54, …

HAA 3.2

1) Find the equation of the line passing through (3 , 4) and (5 , 10)

2) Solve using the quadratic formula (and a calculator), $3x^2 + 5x - 7 = 0$

3) Factorise $6x^2 + 23x + 20$

4) Simplify $\frac{2x}{5} + \frac{3x-4}{6}$

5) Write down the first three terms of the sequence defined by: $x_1 = 2$, $x_{n+1} = 5x_n + 2$

HAA4.1

1) Expand $(x-3)^2(x+4)$

2) r is directly proportional to s. When $r = 60$, $s = 5$.
Find the value of r when $s = 3$

3) Simplify $\frac{x^2+7x+6}{7x-2-6x+3}$

4) If $f(x) = 7 - 2x^2$, find the value of $f(3)$

5) Find the coordinates of the vertex of the graph
$y = x^2 - 8x - 5$

HAA4.2

1) Find the equation of the line parallel to $2y + 4x = 7$ passing through the point (4 , 1)

2) Simplify $\frac{2x+3}{3} + \frac{2x-5}{4}$

3) Sketch the graph of $y = -x^2$

4) A block has a volume of 20cm³, and a density of 4.5g/cm³. Calculate its mass

5) Rationalise the denominator

$$\frac{6\sqrt{3}}{\sqrt{3}-2}$$

HAA5.1

1) Solve simultaneously $3x - 3y = 9$ and $2x - y = 9$

2) One solution of $cos\, x = 0.939692$ is $x = 20°$
What is the other solution in the range $0° \leq x < 360°$?

3) Find the 50th term of the sequences 7, -1, -9, -17, -25, …

4) Find $fg(x)$ where $f(x) = 3x + 2$ and $g(x) = x^2$

5) Simplify $\frac{2}{x+3} - \frac{x}{x+2}$

HAA5.2

1) Shape B is an enlargement of shape A with scale factor 3.
If the area of shape B is 36cm², what is the area of shape A?

2) Work out $4 \times 10^6 \times 6 \times 10^5$, giving your answer in standard form

3) Solve using the quadratic formula (and a calculator)
$5x^2 - 3x - 6 = 0$

4) Evaluate 9^{-2} and $9^{\frac{1}{2}}$

5) The value of x is given as 230 rounded to 2 significant figures.
State the upper and lower bounds

HAA6.1

1) Expand and simplify $(x-3)^3$

2) If $f(x) = 3x^2$ and $g(x) = 3x - 1$ find $fg(x)$

3) Find the equation of the line perpendicular to $3y - x = 6$ passing through the point (2, -7)

4) Find the nth term of the sequence 4, 10, 20, 34, …

5) A car travels 50km in 1 hour 20 minutes, what is its average speed?

HAA6.2

1) m is given as 40 correct to one significant figure.
Write an inequality to show the range of values m could be

2) Shape B is an enlargement of shape A with scale factor 3. If the volume of shape A is 6cm³, what is the volume of shape B?

3) Solve, by factorising, $3x^2 + 16x - 12 = 0$

4) Expand and simplify $\left(4 + \sqrt{3}\right)\left(4 - \sqrt{3}\right)$

5) Sketch the graph of $y = sin\, x$ and $y = cos\, x$