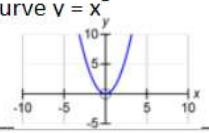
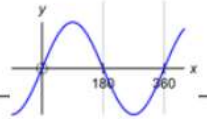
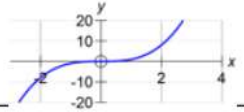
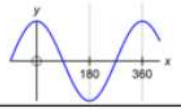
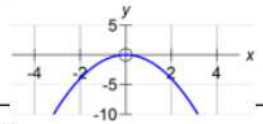
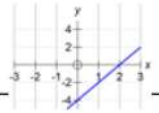
HAA1.1

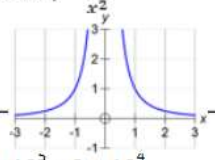
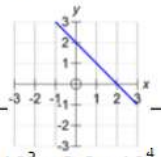
Question 1 Simplify √891 $9\sqrt{11}$	**Question 2** Simplify √176 $4\sqrt{11}$	**Question 3** A car bought for £36000 depreciates in value by 8% each year. Write down a formula for the value of the car v, after t years $v = 36000 \times 0.92^t$	**Question 4** £6000 is invested with an interest rate of 6% per annum. Write a formula for the value of the investment v, after t years $v = 6000 \times 1.06^t$
Question 5 Use the formula $s = \frac{1}{2}(u + v)t$ to find u when s = 360, v = 20 and t = 30 $u = 4$	**Question 6** Use the formula $s = \frac{1}{2}(u + v)t$ to find s when u = 16, v = 16 and t = 90 $s = 1440$	**Question 7** Evaluate $32^{\frac{2}{5}}$ 4	**Question 8** Evaluate $27^{\frac{2}{3}}$ 9
Question 9 A block has a mass of 800g and a volume of 80 cm^3. Calculate the density. $10\ g/cm^3$	**Question 10** A block has a mass of 160g and a density of 40 g/cm^3. Calculate the volume. $4\ cm^3$	**Question 11** Find the nth term of 1, 7, 17, 31,... $2n^2 - 1$	**Question 12** Find the nth term of 1, 4, 9, 16,... n^2
Question 13 Sketch the curve $y = x^2$ 	**Question 14** Sketch the curve y = sin x 	**Question 15** Find the equation of the line with gradient 4 passing through (-1 , -6) $y = 4x - 2$	**Question 16** Find the equation of the line with gradient -2 passing through (-2 , 8) $y = 4 - 2x$
Question 17 Work out $4.2 \times 10^5 + 8.6 \times 10^4$ 506000	**Question 18** Work out $4.2 \times 10^5 + 5.7 \times 10^4$ 477000	**Question 19** Express $x^2 + 10x + 30$ in completed square form $(x + 5)^2 + 5$	**Question 20** Express $x^2 - 4x + 7$ in completed square form $(x - 2)^2 + 3$

HAA1.2

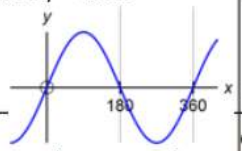
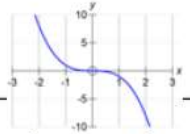
Question 1 Simplify √486 $9\sqrt{6}$	**Question 2** Simplify √350 $5\sqrt{14}$	**Question 3** A car bought for £31000 depreciates in value by 2% each year. Write down a formula for the value of the car v, after t years $v = 31000 \times 0.98^t$	**Question 4** A car bought for £34000 depreciates in value by 3% each year. Write down a formula for the value of the car v, after t years $v = 34000 \times 0.97^t$
Question 5 Use the formula s = ½(u + v)t to find s when u = 18, v = 14 and t = 100 $s = 1600$	**Question 6** Use the formula s = ½(u + v)t to find u when s = 1170, v = 8 and t = 90 $u = 18$	**Question 7** Evaluate 7^0 1	**Question 8** Evaluate $125^{\frac{1}{3}}$ 5
Question 9 A block has a mass of 200g and a density of 100 g/cm^3. Calculate the volume. $2\ cm^3$	**Question 10** A block has a mass of 90g and a density of 60 g/cm^3. Calculate the volume. 1.5 cm3	**Question 11** Find the nth term of 5, 16, 33, 56,... $3n^2 + 2n$	**Question 12** Find the nth term of 2, 10, 24, 44,... $3n^2 - n$
Question 13 Sketch the curve $y = x^3$ 	**Question 14** Sketch the curve y = cos x 	**Question 15** Find the equation of the line with gradient 2 passing through (1 , 6) $y = 2x + 4$	**Question 16** Find the equation of the line with gradient 2 passing through (3 , 16) $y = 2x + 10$
Question 17 Work out $5.3 \times 10^4 + 4.8 \times 10^3$ 57800	**Question 18** Work out $2.5 \times 10^5 - 6.3 \times 10^4$ 187000	**Question 19** Express $x^2 + 2x + 2$ in completed square form $(x + 1)^2 + 1$	**Question 20** Express $x^2 + 4x + 3$ in completed square form $(x + 2)^2 - 1$

HAA1.3

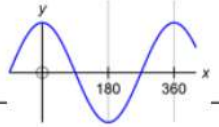
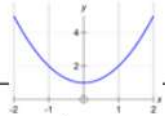
Question 1 Simplify $\sqrt{486}$ $9\sqrt{6}$	**Question 2** Simplify $\sqrt{1134}$ $9\sqrt{14}$	**Question 3** £9000 is invested with an interest rate of 6.5% per annum. Write a formula for the value of the investment v, after t years $v = 9000 \times 1.065^t$	**Question 4** £9000 is invested with an interest rate of 7.5% per annum. Write a formula for the value of the investment v, after t years $v = 9000 \times 1.075^t$
Question 5 Use the formula $s = \frac{1}{2}(u + v)t$ to find v when s = 1000, v = 12 and t = 100 $v = 12$	**Question 6** Use the formula $s = \frac{1}{2}(u + v)t$ to find s when u = 20, v = 10 and t = 70 $s = 1050$	**Question 7** Evaluate $9^{\frac{3}{2}}$ 27	**Question 8** Evaluate $16^{\frac{5}{4}}$ 32
Question 9 A block has a volume of $60cm^3$ and a density of 40 g/cm^3. Calculate the mass. 240 g	**Question 10** A block has a mass of 100g and a volume of 20 cm^3. Calculate the density. $5\ g/cm^3$	**Question 11** Find the nth term of 2, 8, 18, 32,... $2n^2$	**Question 12** Find the nth term of 1, 7, 17, 31,... $2n^2 - 1$
Question 13 Sketch the curve $y = -x^2$ 	**Question 14** Sketch the curve $y = 2x - 4$ 	**Question 15** Find the equation of the line with gradient 5 passing through (2 , 13) $y = 5x + 3$	**Question 16** Find the equation of the line with gradient 4 passing through (-1 , 1) $y = 4x + 5$
Question 17 Work out $5.1 \times 10^4 - 3.8 \times 10^3$ 47200	**Question 18** Work out $5.2 \times 10^4 + 2.4 \times 10^3$ 54400	**Question 19** Express $x^2 + 6x + 10$ in completed square form $(x + 3)^2 + 1$	**Question 20** Express $x^2 - 4x + 13$ in completed square form $(x - 2)^2 + 9$

Question 1 Simplify √192 $8\sqrt{3}$	**Question 2** Simplify √125 $5\sqrt{5}$	**Question 3** £4000 is invested with an interest rate of 7% per annum. Write a formula for the value of the investment v, after t years $v = 4000 \times 1.07^t$	**Question 4** £5000 is invested with an interest rate of 9% per annum. Write a formula for the value of the investment v, after t years $v = 5000 \times 1.09^t$
Question 5 Use the formula $s = \frac{1}{2}(u + v)t$ to find v when s = 1520, v = 18 and t = 80 $v = 18$	**Question 6** Use the formula $s = \frac{1}{2}(u + v)t$ to find s when u = 2, v = 20 and t = 30 $s = 330$	**Question 7** Evaluate $36^{-\frac{3}{2}}$ $\frac{1}{216}$	**Question 8** Evaluate $4^{\frac{5}{2}}$ 32
Question 9 A block has a mass of 780g and a volume of 60 cm^3. Calculate the density. $13\ g/cm^3$	**Question 10** A block has a mass of 100g and a volume of 50 cm^3. Calculate the density. $2\ g/cm^3$	**Question 11** Find the nth term of 0, 2, 6, 12,... $n^2 - n$	**Question 12** Find the nth term of -2, -2, 0, 4,... $n^2 - 3n$
Question 13 Sketch the curve $y = \frac{1}{x^2}$ 	**Question 14** Sketch the curve y = 2 - x 	**Question 15** Find the equation of the line with gradient -3 passing through (2 , -5) $y = 1 - 3x$	**Question 16** Find the equation of the line with gradient -3 passing through (-2 , 9) $y = 3 - 3x$
Question 17 Work out $2 \times 10^5 + 2 \times 10^4$ 220000	**Question 18** Work out $4.8 \times 10^5 + 8.6 \times 10^4$ 566000	**Question 19** Express $x^2 - 2x - 4$ in completed square form $(x - 1)^2 - 5$	**Question 20** Express $x^2 + 6x + 3$ in completed square form $(x + 3)^2 - 6$

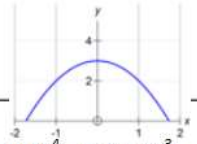
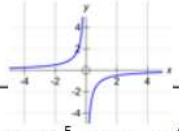
HAA1.5

Question 1 Simplify √405 $9\sqrt{5}$	**Question 2** Simplify √704 $8\sqrt{11}$	**Question 3** £10000 is invested with an interest rate of 3% per annum. Write a formula for the value of the investment v, after t years $v = 10000 \times 1.03^t$	**Question 4** A car bought for £46000 depreciates in value by 7% each year. Write down a formula for the value of the car v, after t years $v = 46000 \times 0.93^t$
Question 5 Use the formula $s = \frac{1}{2}(u + v)t$ to find u when s = 280, v = 20 and t = 20 $u = 8$	**Question 6** Use the formula $s = \frac{1}{2}(u + v)t$ to find u when s = 800, v = 12 and t = 80 $u = 8$	**Question 7** Evaluate $4^{-\frac{3}{2}}$ $\frac{1}{8}$	**Question 8** Evaluate $81^{\frac{3}{4}}$ 27
Question 9 A block has a mass of 700g and a density of 7 g/cm^3. Calculate the volume. 100 cm3	**Question 10** A block has a volume of 80cm^3 and a density of 2.5 g/cm^3. Calculate the mass 200 g	**Question 11** Find the nth term of 0, 6, 18, 36,... $3n^2 - 3n$	**Question 12** Find the nth term of 5, 14, 27, 44,... $2n^2 + 3n$
Question 13 Sketch the curve y = sin x 	**Question 14** Sketch the curve y = -x^3 	**Question 15** Find the equation of the line with gradient 3 passing through (1 , 8) $y = 3x + 5$	**Question 16** Find the equation of the line with gradient 5 passing through (-2 , -7) $y = 5x + 3$
Question 17 Work out $5.2 \times 10^4 + 4.2 \times 10^3$ 56200	**Question 18** Work out $2.1 \times 10^4 - 6.9 \times 10^3$ 14100	**Question 19** Express $x^2 + 8x + 26$ in completed square form $(x + 4)^2 + 10$	**Question 20** Express $x^2 + 4x - 4$ in completed square form $(x + 2)^2 - 8$

HAA1.6

Question 1 Simplify √80 $4\sqrt{5}$	**Question 2** Simplify √45 $3\sqrt{5}$	**Question 3** A car bought for £28000 depreciates in value by 1% each year. Write down a formula for the value of the car v, after t years $v = 28000 \times 0.99^t$	**Question 4** £7000 is invested with an interest rate of 9% per annum. Write a formula for the value of the investment v, after t years $v = 7000 \times 1.09^t$
Question 5 Use the formula $s = \frac{1}{2}(u + v)t$ to find t when u = 2, v = 12 and s = 490 $t = 70$	**Question 6** Use the formula $s = \frac{1}{2}(u + v)t$ to find v when s = 120, v = 4 and t = 10 $v = 4$	**Question 7** Evaluate $27^{-\frac{4}{3}}$ $\frac{1}{81}$	**Question 8** Evaluate $-125^{\frac{1}{3}}$ -5
Question 9 A block has a mass of 720g and a volume of 90 cm^3. Calculate the density. $8\ g/cm^3$	**Question 10** A block has a mass of 840g and a volume of 70 cm^3. Calculate the density. $12\ g/cm^3$	**Question 11** Find the nth term of 0, 4, 12, 24,... $2n^2 - 2n$	**Question 12** Find the nth term of 5, 14, 27, 44,... $2n^2 + 3n$
Question 13 Sketch the curve y = cos x 	**Question 14** Sketch the curve $y = x^2 + 1$ 	**Question 15** Find the equation of the line with gradient 5 passing through (-3 , -17) $y = 5x - 2$	**Question 16** Find the equation of the line with gradient -2 passing through (-3 , 4) $y = -2x - 2$
Question 17 Work out $2 \times 10^5 + 9 \times 10^4$ 290000	**Question 18** Work out $3.9 \times 10^4 - 6.9 \times 10^3$ 32100	**Question 19** Express $x^2 - 6x + 14$ in completed square form $(x - 3)^2 + 5$	**Question 20** Express $x^2 + 2x + 5$ in completed square form $(x + 1)^2 + 4$

HAA1.7

Question 1 Simplify √704 $8\sqrt{11}$	**Question 2** Simplify √448 $8\sqrt{7}$	**Question 3** £8000 is invested with an interest rate of 5.5% per annum. Write a formula for the value of the investment v, after t years $v = 8000 \times 1.055^t$	**Question 4** A car bought for £4000 depreciates in value by 4% each year. Write down a formula for the value of the car v, after t years $v = 4000 \times 0.96^t$
Question 5 Use the formula s = 1/2(u + v)t to find v when s = 1350, u = 14 and t = 90 v = 14	**Question 6** Use the formula s = 1/2(u + v)t to find u when s = 400, v = 4 and t = 40 u = 16	**Question 7** Evaluate $125^{-\frac{2}{3}}$ $\frac{1}{25}$	**Question 8** Evaluate $8^{\frac{7}{3}}$ 128
Question 9 A block has a volume of $30cm^3$ and a density of 5 g/cm^3. Calculate the mass. 150 g	**Question 10** A block has a mass of 630g and a volume of 90 cm^3. Calculate the density. $7\ g/cm^3$	**Question 11** Find the nth term of 0, 2, 6, 12,... $n^2 - n$	**Question 12** Find the nth term of 0, 6, 18, 36,... $3n^2 - 3n$
Question 13 Sketch the curve $y = 3 - x^2$ 	**Question 14** Sketch the curve $y = -\frac{1}{x}$ 	**Question 15** Find the equation of the line with gradient -4 passing through (-1 , 3) $y = -4x - 1$	**Question 16** Find the equation of the line with gradient 5 passing through (-1 , -6) $y = 5x - 1$
Question 17 Work out $2.6 \times 10^4 - 8.2 \times 10^3$ 17800	**Question 18** Work out $1.8 \times 10^5 - 7.9 \times 10^4$ 101000	**Question 19** Express $x^2 - 10x + 37$ in completed square form $(x - 5)^2 + 12$	**Question 20** Express $x^2 - 8x + 9$ in completed square form $(x - 4)^2 - 7$