# National 5 & Int. 2 — Simultaneous Equations

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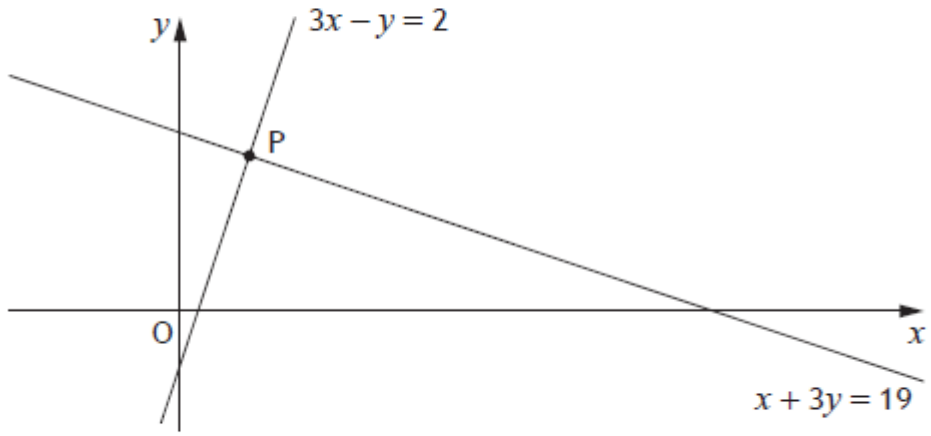
| *2018 P1 Q3* | Solve, algebraically, the system of equations<br>$4x+5y=-3$<br>$6x-2y=5.$ | 3 |
| *Ans* | *x = 0·5 , y = -1* | |
| *2017 P1 Q13* | The graph below shows two straight lines with the equations:<br>• $3x-y=2$<br>• $x+3y=19$<br>  <br>The lines intersect at the point P.<br>Find, **algebraically**, the coordinates of P. | 3 |
| *Ans* | *(2·5 , 5·5)* | |
| *2016 P1 Q4* | Charlie is making costumes for a school show.<br>One day he made 2 cloaks and 3 dresses.<br>The total amount of material he used was 9·6 square metres.<br>(a) Write down an equation to illustrate this information.<br>(b) The following day Charlie made 3 cloaks and 4 dresses.<br>The total amount of material he used was 13·3 square metres.<br>Write down an equation to illustrate this information.<br>(c) Calculate the amount of material required to make one cloak and the amount of material required to make one dress. | 1<br>1<br>4 |
| *Ans* | *2c + 3d = 9·6 (b) 3c + 4d = 13·3 (c) cloak = 1·5m$^2$ , dress = 2·2m$^2$* | |

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| *2015 P1 Q11* | Solve algebraically the system of equations<br><br>$3x + 2y = 17$<br>$2x + 5y = 4.$ | 3 |
| *Ans* | *x = 7 , y = -2* | |
| *2015 P1 Q8* | Using **graphical** means, solve the system of equations:<br><br>$y = 2x + 5$<br>$y = 3x + 6.$<br><br>**Use the squared paper provided.** | 3 |
| *Ans* | *x = -1 , y = 3* | |
| *2014 P2 Q3* | Two groups of people go to a theatre.<br>Bill buys tickets for 5 adults and 3 children.<br>The total cost of his tickets is £158·25.<br><br>(a) Write down an equation to illustrate this information.<br><br>(b) Ben buys tickets for 3 adults and 2 children.<br>The total cost of his tickets is £98.<br>Write down an equation to illustrate this information.<br><br>(c) Calculate the cost of a ticket for an adult and the cost of a ticket for a child. | 1<br><br>1<br><br>4 |
| *Ans* | *(a) 5a + 3c = 158·25 (b) 3a + 2c = 98*<br>*(c) Adult Ticket costs £22·50. Child Ticket costs £15·25* | |
| *2014 P2 Q4* | Mr Smith and Mrs Curran both shop at the same store.<br><br>(*a*) Mr Smith bought 3 loaves and 2 packets of butter. The total cost was £4·73.<br>Let $x$ pounds be the cost of a loaf and $y$ pounds be the cost of a packet of butter.<br>Write down an equation in $x$ and $y$ which satisfies the above condition.<br><br>(*b*) Mrs Curran bought 5 loaves and 3 packets of butter. The total cost was £7·52.<br>Write down a second equation in $x$ and $y$ which satisfies this condition.<br><br>(*c*) Use the equations in parts (*a*) and (*b*) to find the cost of a loaf and the cost of a packet of butter. | 1<br><br>1<br><br>4 |
| *Ans* | *(a) 3x + 2y = 4·73 (b) 5x + 3y = 7·52 (c) A loaf costs £0·85 and a packet of butter costs £1·09.* | |

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| *2013 P1 Q4* | Solve algebraically the system of equations<br>$2x - y = 10$<br>$4x + 5y = 6.$ | 3 |
| *Ans* | *x = 4 , y = -2* | |
| *2012 P2 Q6* | Three groups are booking a holiday. The first group consists of 6 adults and 2 children. The total cost of their holiday is £3148.<br>Let $x$ pounds be the cost for an adult and $y$ pounds be the cost for a child.<br>(*a*) Write down an equation in $x$ and $y$ which satisfies the above information.<br>The second group books the same holiday for 5 adults and 3 children. The total cost of their holiday is £3022.<br>(*b*) Write down a second equation in $x$ and $y$ which satisfies this information.<br>(*c*) The third group books the same holiday for 2 adults and 4 children. The travel agent calculates that the total cost is £2056.<br>Has this group been overcharged?<br>Justify your answer. | 1<br>1<br>4 |
| *Ans* | *(a) 6x + 2y = 3148 (b) 5x = 3y = 3022 (c) Yes, the group has been overcharged by £10.* | |
| *2011 P2 Q7* | Alan is taking part in a quiz. He is awarded $x$ points for each correct answer and $y$ points for each wrong answer. During the quiz, Alan gets 24 questions correct and 6 wrong. He scores 60 points.<br>(*a*) Write down an equation in $x$ and $y$ which satisfies the above condition.<br>Helen also takes part in the quiz. She gets 20 questions correct and 10 wrong. She scores 40 points.<br>(*b*) Write down a second equation in $x$ and $y$ which satisfies this condition.<br>(*c*) Calculate the score for David who gets 17 correct and 13 wrong. | 1<br>1<br>4 |
| *Ans* | *(a) 24x + 6y = 60 (b) 20x + 10y = 40 (c) 25 points* | |
| *2010 P2 Q5* | Solve algebraically the system of equations<br>$2x - 5y = 24$<br>$7x + 8y = 33.$ | 3 |
| *Ans* | *x = 7 , y = -2* | |

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| *2009 P2 Q4* | There are 14 cars and 60 passengers on the morning crossing of the ferry from Wemyss Bay to Rothesay. The total takings are £344·30.<br><br>(*a*) Let $x$ pounds be the cost for a car and $y$ pounds be the cost for a passenger.<br>Write down an equation in $x$ and $y$ which satisfies the above condition.<br><br>(*b*) There are 21 cars and 40 passengers on the evening crossing of the ferry. The total takings are £368·95.<br>Write down a second equation in $x$ and $y$ which satisfies this condition.<br><br>(*c*) Find the cost for a car and the cost for a passenger on the ferry. | 1<br><br>1<br><br>4 |
| *Ans* | *(a) 14x + 60y = 344.30 (b) 21x + 40y = 368·95 (c) A car costs £11·95 & a passenger £2·95* | |
| *2008 P2 Q4* | Suzie has a new mobile phone. She is charged $x$ pence per minute for calls and $y$ pence for each text she sends. During the first month her calls last a total of 280 minutes and she sends 70 texts. Her bill is £52·50.<br><br>(*a*) Write down an equation in $x$ and $y$ which satisfies the above condition.<br><br>The next month she reduces her bill. She restricts her calls to 210 minutes and sends 40 texts. Her bill is £38·00.<br><br>(*b*) Write down a second equation in $x$ and $y$ which satisfies this condition.<br><br>(*c*) Calculate the price per minute for a call and the price for each text sent. | 1<br><br>1<br><br>4 |
| *Ans* | *(a) 280x + 70y = 5250 (b) 210x + 40y = 3800 (c) Call = 16p per minute , Text = 11p* | |
| *2007 P1 Q4* | Find the point of intersection of the straight lines with equations $x + 2y = -5$ and $3x - y = 13$. | 4 |
| *Ans* | *(3,-4)* | |
| *2006 P2 Q2* | Solve algebraically the system of equations<br><br>$4x + 2y = 13$<br><br>$5x + 3y = 17$. | 3 |
| *Ans* | *x = 2·5 , y = 1·5* | |

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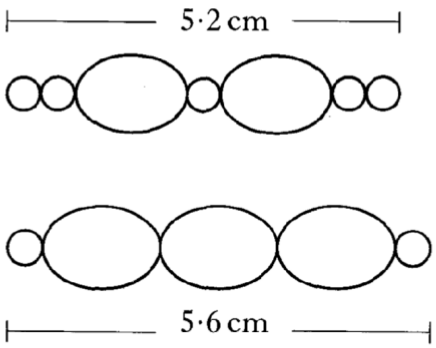
| *2005 P2 Q4* | A jeweller uses two different arrangements of beads and pearls.<br>  <br><br>The first arrangement consists of 2 beads and 5 pearls and has an overall length of 5·2 centimetres.<br>The second arrangement consists of 3 beads and 2 pearls and has an overall length of 5·6 centimetres.<br>Find the length of **one** bead and the length of **one** pearl. | 6 |
| *Ans* | *Bead = 1·6cm , Pearl = 0·4cm* | |
| *2004 P2 Q5* | A sports centre charges different entrance fees for adults and children.<br>(*a*) One evening 14 adults and 4 children visited the sports centre. The total collected in entrance fees was £55·00.<br>Let £$x$ be the adult's entrance fee and £$y$ be the child's entrance fee.<br>Write down an equation in $x$ and $y$ which represents the above condition.<br>(*b*) The following evening 13 adults and 6 children visited the sports centre. The total collected in entrance fees was £54·50.<br>Write down a second equation in $x$ and $y$ which represents the above condition.<br>(*c*) Calculate the entrance fee for an adult and the entrance fee for a child. | 1<br>1<br>4 |
| *Ans* | *(a) 14x + 4y = 55 (b) 13x + 6y = 54·5 (c) Adult = £3·50 , Child = £1·50* | |

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| *2003 P2 Q3* | Seats on flights from London to Edinburgh are sold at two prices, £30 and £50.<br>On one flight a total of 130 seats was sold.<br>Let $x$ be the number of seats sold at £30 and $y$ be the number of seats sold at £50.<br><br>(*a*) Write down an equation in $x$ and $y$ which satisfies the above condition.<br><br>The sale of the seats on this flight totalled £6000.<br><br>(*b*) Write down a second equation in $x$ and $y$ which satisfies this condition.<br><br>(*c*) How many seats were sold at each price? | 1<br><br>1<br><br>4 |
| *Ans* | *(a) $x + y = 130$ (b) $30x + 50y = 6000$ (c) 25 seats at £30 and 105 seats at £50* | |
| *2002W P2 Q5* | At an amusement park, the Green family buy 3 tickets for the ghost train and 2 tickets for the sky ride. The total cost is £8·60.<br><br>(*a*) Let $x$ pounds be the cost of a ticket for the ghost train and $y$ pounds be the cost of a ticket for the sky ride.<br>Write down an equation in $x$ and $y$ which satisfies the above condition.<br><br>(*b*) The Black family bought 5 tickets for the ghost train and 3 tickets for the sky ride at the same amusement park. The total cost was £13·60.<br>Write down a second equation in $x$ and $y$ which satisfies this condition.<br><br>(*c*) Find the cost of a ticket for the ghost train and the cost of a ticket for the sky ride. | 1<br><br>1<br><br>4 |
| *Ans* | *(a) $3x + 2y = 8.60$ (b) $5x + 3y = 13.60$ (c) $x$ = £1·40 , $y$ = £2·20* | |
| *2002 P2 Q2* | Solve **algebraically** the system of equations<br><br>$3x - 2y = 11$<br>$2x + 5y = 1.$ | 3 |
| *Ans* | *$x = 3$ , $y = -1$* | |
| *2001 P1 Q3* | Find the point of intersection of the straight lines with equations $2x + y = 5$ and $x - 3y = 6$. | 4 |
| *Ans* | *(3,-1)* | |