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| **National 5 Homework Exercise 15** | | | | | | | | | | | | C:\Users\Ian\Pictures\CHS.jpg | | | |
|  | | | | | | | | | | | |
| **Simultaneous Equations** | | | | | | | | | | | |
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| Issued by: | | | |  | | | Return by: | | |  | | | | | |
|  | | | | | | | | | | | | | | | |
| **Working MUST be shown in every answer.** | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | |
| **1.** | a) | | Find the points where these graphs cut the *x* – and *y* – axes: | | | | | | | | | | | | |
|  |  | |  | | | | | | | | | | | | |
|  |  | | (i) | | *y* = *x* – 2 | | | | (ii) | | *x* + 2*y* – 8 = 0 | | | | |
|  |  | |  | |  | | | |  | |  | | | | |
|  | b) | | Use your answers to part a) to sketch the two graphs ON THE SAME DIAGRAM. | | | | | | | | | | | | |
|  |  | |  | | | | | | | | | | | | |
|  | c) | | Use your diagram to find the point of intersection of the two graphs. | | | | | | | | | | | | |
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| **2.** | Solve the following pairs of simultaneous equations. | | | | | | | | | | | | | | |
|  |  |  | | | | | | | | | | | | | |
|  | a) | *x* + *y* = 56  *x* – *y* = 16 | | | | b) | | 4*a* – 3*b* = 18  *a* + 3*b* = -3 | | | | | c) | 2*b* – *c* = -3  3*b* + 2*c* = 13 | |
|  |  |  | | | |  | |  | | | | |  |  | |
|  | d) | *y* + *x* = 45  *y* – *x* = 4 | | | | e) | | 3*p* – 4*q* = -1  5*p* – 2*q* = -11 | | | | | f) | 7*g* + 4*h* = 36  3*g* + 6*h* = 24 | |
|  |  |  | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
| **3.** | For each question below, make two separate equations and solve them to obtain the answer. | | | | | | | | | | | | | | |
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|  | a) |  | | | | | | The total length of two planks of wood is 4.5 metres. | | | | | | | |
|  |  |  | | | | | | | |
|  |  | The long plank is 0.5 metres longer than the short plank. | | | | | | | |
|  |  |  | | | | | | | |
|  |  | Find the length of each plank of wood. | | | | | | | |
|  |  |  | | | | | | | | | | | | | |
|  |  |  | | | | | | | | | | | | | |
|  | b) | In a game show, points are awarded for correct answers and points are deducted for wrong answers. | | | | | | | | | | | | |  |
|  |  |  | | | | | | | | | | | | |
|  |  | In Round 1, Pauline gave 9 correct answers and 3 wrong answers for a score of 21 points. | | | | | | | | | | | | |
|  |  |  | | | | | | | | | | | | |
|  |  | James gave 7 correct answers and 5 wrong answers for a score of 11 points. | | | | | | | | | | | | |
|  |  |  | | | | | | | | | | | | |
|  |  | Find how many points are awarded for a correct answer, and how many are deducted per incorrect answer. | | | | | | | | | | | | |
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|  |  |  | | | | | | | | | | | | | |
|  | c) |  | | | | | EasyAir are doing a special offer on flights to Spain. The standard flight costs £45, and the special offer costs £2 (subject to availability). | | | | | | | | |
|  |  |  | | | | | | | | |
|  |  | An EasyAir plane holds 150 passengers. If the flight was full, EasyAir would have received £6535 in ticket sales. | | | | | | | | |
|  |  |  | | | | | | | | |
|  |  | How many special offer seats are EasyAir selling on each flight? | | | | | | | | |
|  |  |  | | | | | | | | |

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|  | **Award 1 Mark for each ●** | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| **1.** | a) | (i) | | ● (2, 0) | (ii) | | ● (8, 0) | | | | | | | b) | ● y = x – 2 correctly drawn | | | | | | | | | | c) | ● (4, 2) |
|  |  |  | | ● (0, -2) |  | | ● (0, 4) | | | | | | |  | ● x + 2y – 8 = 0 correctly drawn | | | | | | | | | |  |  |
|  |  |  | |  | |  | | |  | | | | | |  | | | | | | |  | |  | | |
| **2.** | a) | ● x = 36 | | | | | | b) | | ● a = 3 | | | | | | c) | ● 4b – 2c = -6 | | | | | | d) | | ● y = 24.5 | |
|  |  | ● y = 20 | | | | | |  | | ● b = - 2 | | | | | |  | ● b = 1 | | | | | |  | | ● x = 20.5 | |
|  |  |  | | | | | |  | |  | | | | | |  | ● c = 5 | | | | | |  | |  | |
|  |  |  | | | | | |  | |  | | | | | |  |  | | | | | |  | |  | |
|  | e) | ● | scaling | | | | | f) | | ● | scaling | | | | | | |  | | | | | | | | |
|  |  | ● p = -3 | | | | | |  | | ● g = 4 | | | | | | | |  |  | | | |  | |  | |
|  |  | ● q = -2 | | | | | |  | | ● h = 2 | | | | | | | |  |  | | | |  | |  | |
|  |  |  | | | | | |  | |  | | | | | | | |  |  | | | |  | |  | |
| **3.** | a) | ● x + y = 4.5 | | | | | | | | | | b) | ● 9x + 3y = 21 | | | | | | | c) | ● x + y = 150 | | | | | |
|  |  | ● x – y = 0.5 | | | | | | | | | |  | ● 7x + 5y = 11 | | | | | | |  | ● 45x + 2y = 6535 | | | | | |
|  |  | ● x = 2.5 or y = y | | | | | | | | | |  | ● Evidence of scaling | | | | | | |  | ● Evidence of scaling | | | | | |
|  |  | ● long = 2.5m, short = 2m | | | | | | | | | |  | ● x = 3 or y = -2 | | | | | | |  | ● x = 145 or y = 5 | | | | | |
|  |  |  | | | | | | | | | |  | ● 3 points for correct, 2 points off for wrong | | | | | | |  | ● 5 special offer seats | | | | | |
|  |  |  | | | | | | | | | |  |  | | | | | | |  |  | | | | | |
|  | **TOTAL: 36 MARKS** | | | | | | | | | | | | | | | | | | | | | | | | | |