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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S3 National 5 Homework Exercise 6** | | | | | | | | | | | | | | | | C:\Users\Ian\Pictures\CHS.jpg | | | | | | |
|  | | | | | | | | | | | | | | | |
| **Brackets and Factorising** | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| Issued by: | | |  | | | | | | | | Return by: | | | | |  | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **1.** | Remove brackets and simplify where necessary. | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | | | | | | | | |
|  | a) | (x + 1)(x + 3) | | b) | | (a – 4)(a + 9) | | | | | | c) | | (p + 3)(p – 3) | | | | | d) | | (3x – 2)(2x + 5) | |
|  |  |  | |  | |  | | | | | |  | |  | | | | |  | |  | |
|  | e) | (x + 7)(4 – x) | | f) | | (x + 12)2 | | | | | | g) | | (3f – 2)2 | | | | | h) | | (d – 1)(d2 + 3d – 5) | |
|  |  |  | | | | | | |  |  | | | | | | |  |  | | | | |
| **2.** | Solve for x: | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | | | | | |  |  | | | | | | |  |  | | | | |
|  | a) | 3(x + 2) = 24 | | | | | | | b) | 9(x – 5) = -27 | | | | | | | c) | 4(x – 9) = x – 3 | | | | |
|  |  |  | | | | | | |  |  | | | | | | |  |  | | | | |
| **3.** | Simplify: | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | | | | | |  |  | | | | | | |  |  | | | | |
|  | a) | (x – 2)2 + (3x + 1)2 | | | | | | | b) | (g + 2)(2g – 3) – (g + 4)2 | | | | | | | c) | (x + 1)(x – 1) – (x – 1) | | | | |
|  |  |  | | | | | | |  |  | | | | | | |  |  | | | | |
| **4.** | Remove common factors in each example below. | | | | | | | | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | | | | | | | | |
|  | a) | 4x – 10 | | | b) | | 9x + 15 | | | | | | c) | | 6z + 3 | | | | | d) | | 2xy – 6x |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | e) | x2 – 6x | | | f) | | 3p3 – 9p2 | | | | | | g) | | 36xy – 54x2 | | | | | h) | | 3abc – 6b2d |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
| **5.** | Use the difference of two squares to factorise: | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | a) | x2 – 25 | | | b) | | x2 - 1 | | | | | | c) | | 4x2 - 9 | | | | | d) | | 49a2 - b2 |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | e) | 100x2 - 9y2 | | | f) | | 16x2 – 169y2 | | | | | | g) | | 49 – 25g2 | | | | | h) | | a4 - 9 |
|  |  | | | | | | | | | | | | | | | | | | | | | |
| **6.** | Factorise these trinomial expressions: | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | a) | x2 + 11x + 18 | | | b) | | x2 + 12x +20 | | | | | | c) | | x2 - 11x + 30 | | | | | d) | | x2 - 13x - 30 |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | e) | x2 - 10x +24 | | | f) | | x2 + 7x - 8 | | | | | | g) | | 8x2 – 10x - 3 | | | | | h) | | 12x2 – 17x + 6 |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
| **7.** | Factorise **fully**: | | | | | | | | | | | | | | | | | | | | | |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | a) | 20x2 - 5 | | | b) | | 3x2 + 18x - 48 | | | | | | c) | | x2 - x – 56 | | | | | d) | | 3x2 - 75 |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  | e) | 72 - 32x2 | | | f) | | 2x2 -14x -36 | | | | | | g) | | 4x2 + 12x – 72 | | | | | h) | | 8x2 + 44x + 60 |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  |  |  | | |  | |  | | | | | |  | |  | | | | |  | |  |
|  |  | | | | | | |  | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
|  | COMMON FACTOR | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
|  | then | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
|  | DIFFERENCE OF TWO SQUARES | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
|  | then | | | | | | | | | | | | | | |
|  |  | | | | | | | | | | | | | | |
|  | TRINOMIAL! | | | | | | | | | | | | | | |
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| **Q.** | **Award 1 Mark for each ●** | | | | | | | | | | | |
|  |  | | | | | | | | | | | |
| **1.** | a) | ● x2 + 4x + 3 | b) | ● a2 + 5a - 36 | | | c) | ● p2 - 9 | | | d) | ● 6x2 + 11x - 10 |
|  |  |  |  |  | | |  |  | | |  |  |
|  | e) | ● 28 - 3x – x2 | f) | ● x2 + 24x + 144 | | | g) | ● 9f2 – 12f + 4 | | | h) | ● d3 + 3d2 – 5d… |
|  |  |  |  |  | | |  |  | | |  | ● … -d2 - 3d + 5 |
|  |  |  |  |  | | |  |  | | |  | ● d3 + 2d2 – 8d + 5 |
|  |  |  | | |  |  | | |  |  | | |
| **2.** | a) | ● 3x + 6 = 24 | | | b) | ● 9x – 45 = - 27 | | | c) | ● 4x – 36 = x – 3 | | |
|  |  | ● x = 6 | | |  | ● x = 2 | | |  | ● 3x = 33 | | |
|  |  |  | | |  |  | | |  | ● x = 11 | | |
|  |  |  | | |  |  | | |  |  | | |
| **3.** | a) | ● x2 – 4x + 4 + (…) | | | b) | ● 2g2 + g – 6 – (…) | | | c) | ● x2 – 1 – (x – 1) | | |
|  |  | ● (…) + 9x2 + 6x + 1 | | |  | ● – (g2 + 8g + 16) | | |  | ● x2 - x | | |
|  |  | ● 10x2 + 2x + 5 | | |  | ● g2 – 7g - 22 | | |  |  | | |
|  |  |  | | |  |  | | |  |  | | |
| **4.** | a) | ● 2(2x – 5) | b) | ● 3(3x + 5) | | | c) | ● 3 (2z + 1) | | | d) | ● 2x(y – 3) |
|  |  |  |  |  | | |  |  | | |  |  |
|  | e) | ● x(x – 6) | f) | ● 3p2(p – 3) | | | g) | ● 18x(2y – 3x) | | | h) | ● 3b(ac – 2bd) |
|  |  |  |  |  | | |  |  | | |  |  |
| **5.** | a) | ● (x + 5)(x – 5) | b) | ● (x + 1)(x – 1) | | | c) | ● (2x + 3)(2x – 3) | | | d) | ● (7a + b)(7a – b) |
|  |  |  |  |  | | |  |  | | |  |  |
|  | e) | ●(10x + 3y)(10x – 3y) | f) | ● (4x + 13y)(4x – 13y) | | | g) | ● (7 + 5g)(7 – 5g) | | | h) | ● (a2 +3)(a2 – 3) |
|  |  |  |  |  | | |  |  | | |  |  |
| **6.** | In each case: | | 2/2 if both brackets correct | | | | | | | | | |
|  |  | | 1/2 if brackets give correct x2 term and constant but not x term | | | | | | | | | |
|  |  |  |  |  | | |  |  | | |  |  |
|  | a) | (x + 9)(x + 2) | b) | (x + 10)(x + 2) | | | c) | (x – 5)(x – 6) | | | d) | (x – 15)(x + 2) |
|  |  |  |  |  | | |  |  | | |  |  |
|  | e) | (x – 4)(x – 6) | f) | (x + 8)(x – 1) | | | g) | (4x + 1)(2x - 3) | | | h) | (4x - 3)(3x - 2) |
|  |  |  |  |  | | |  |  | | |  |  |
| **7.** | a) | ● 5(4x2 – 1) | b) | ● 3(x2 + 6x – 16) | | | c) | ●● (x – 8)(x + 7) | | | d) | ● 3(x2 – 25) |
|  |  | ● 5(2x + 1)(2x – 1) |  | ●● 3(x + 8)(x – 2) | | |  |  | | |  | ● 3(x + 5)(x – 5) |
|  |  |  |  |  | | |  |  | | |  |  |
|  | e) | ● 8(9 – 4x2) | f) | ● 2(x2 – 7x – 18) | | | g) | ● 4(x2 + 3x – 18) | | | h) | ● 4(2x2 + 11x + 15) |
|  |  | ● 8(3 - 2x)(3 + 2x) |  | ●● 2(x – 9)(x + 2) | | |  | ●● 4(x + 6)(x – 3) | | |  | ●● 4(2x + 5)(x + 3) |
|  |  |  |  |  | | |  |  | | |  |  |
|  | **Total = 78 marks** | | | | | | | | | | | |
|  |  |  |  |  | | |  |  | | |  |  |
|  |  |  |  |  | | |  |  | | |  |  |