Multiple choice section

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Answer | B | B | A | D | C | A | A | B | C |

Question 1 [3.1]

B

2(a + 4) = 2 × a + 2 × 4

= 2a + 8

Question 2 [3.1]

B

b(3b – 5) = b × 3b + b × -4

= 3b2 – 5b

Question 3 [3.1]

A



Question 4 [3.2]

D

4a = 2 × 2 × a  
2ab = 2 × a × b

HCF = 2a

Question 5 [3.4]

C

The dilation factor is the coefficient of the largest power of the variable x. Here it is 2.

Question 6 [3.4]

A

The equation is in the form y = (x – h)2 + k, where h is the horizontal translation and k is the vertical translation. The graph has been translated 2 units to the right and 5 units up.

Question 7 [3.1]

A

(x + 3)(x + 2) = x2 + 3x + 2x + 6 = x2 + 5x + 6

Question 8 [3.6]

B

Using the difference of two squares

k2 – 25 = (k + 5)(k – 5)

Question 9 [3.7]

C

× = 6 × = 4

Multiple-choice total marks: 9

Short answer section

Question 10 2 marks [3.2, 3.5]

(a) HCF is an abbreviation for highest common factor.

(b) The expression x2 + 3x + 2 is a quadratic trinomial because it has three terms and the highest power of x is 2.

Question 11 2 marks [3.2]

Factorising using ‘difference of two squares’ is a shortcut when factorising an expression that has one square term subtracted from another. For a2 – 9, a2 and 9 are both square terms so this shortcut can be used.

a2 – 9 = a2 – 32 = (a – 3)(a + 3)

Question 12 3 marks [3.1]

2(5g + 4) + 3(g – 1)

= 2 × 5g + 2 × 4 + 3 × g + 3 × -1

= 10g + 8 + 3g – 3

= 13g + 5

Question 13 4 marks [3.2]

(a) (i) HCF of 15 and 5 is 5 (ii) cd = c × d, cde = c × d × e, HCF = cd

(b) HCF = 5cd

(c) 15cd – 5cde = 5cd(3 – e)

Question 14 3 marks [3.2

(a) Area of small rectangle = length × width

= x × 5

= 5x

(b) Shaded area: Shaded area = area of large rectangle – area of small rectangle

= xy – 5x

(c) Shaded area: xy – 5x = x × y – x × 5

= x(y – 5)

Question 15 3 marks [3.4]

(a) The dilation factor is 3. The graph becomes narrower (or stretched vertically) by a factor of 3.

(b) horizontal translation 2 units left

(c) vertical translation 4 units up

Question 16 4 marks [3.5]

(a)

|  |  |
| --- | --- |
| a | b |
| 1 | 12 |
| 2 | 6 |
| 3 | 4 |

(b) 3 + 4 = 7

(c) (x + 3)(x + 4)

Question 17 2 marks [3.5]

-15 = -5 × 3, -5 + 3 = -2

x2 – 2x – 15 = (x – 5)(x + 3)

Question 18 4 marks [3.2]

(a) The garden is a square.  
Area = length2 = a2

(b) Grass area  
= area of garden – area of fish pond  
= a2 – 9b2

(c) a2 – 9b2  
= a2 – (3b)2  
= (a – 3b)(a + 3b)

Question 19 3 marks [3.7]

(a) 4a + 17 + a – 2 = 5a + 15

(b) 5(a + 3)

(c)    
=   
= 5

Short answer total marks: 28

Extended answer section

Question 21 5 marks [3.5]

(a)   
h = -02 – 4 × 0 + 5 = 5 m

(b) -t2 – 4t + 5  
= -(t2 + 4t – 5)  
= -(t + 5)(t – 1)

(c) h = -(t + 5)(t – 1  
t = 1  
h = -(1 + 5)(1 – 1) = 0

Question 22 10 marks [3.1, 3.2]

|  |  |
| --- | --- |
| (a) Area of A = xy  (b) (i) length of B = x + z  (ii) Area of B = length × width  = x(x + z)  **PM10_PR_TF_2_02**  (c) Area of A + area of B = xy + x(x + z)  = xy + x2 + xz  = x2 + xy + xz | (d) Area of rectangle = length × width  = (x + z)(x + y)  = x2 + xy + xz + yz  (e) Area of C = length × width = yz  (f) Shaded area  = x2 + xy + xz + yz – yz  = x2 + xy + xz  (g) The answers to **(c)** and **(f)** are equal. They are two different ways for finding the shaded area. |

Extended answer total marks: 15

TOTAL test marks: 52