Multiple-choice section

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Answer | A | A | C | C | D | D | A | D | C | A |

Question 1 [3.1]

A

Look for the number in front of *drg* . The coefficient is -7.

Question 2 [3.2]

A

= -28 – -

= -

Question 3 [3.2]

C

3(-3)2(2) – 4(-3)(2)2 = 3(9)(2) – 4(-3)(4)  
 = 54 + 48  
 = 102

Question 4 [3.3]

C

*T* = 2 × 

= 44

Question 5 [3.4]

D

2*x*3 – 3*xy* + *xy* + 5*x*2 – *x*3 = 2*x*3 – *x*3 – 3*xy* + *xy* + 5*x*2

= *x*3 – 2*xy* + 5*x*2

Question 6 [3.5]

D

-8*a* × 3*b* × -2*c* + 5*a* × 2*ab* = 48*abc* + 10*a*2*b*

Question 7 [3.5]

A

63*xy*2 ÷ -9*xy* × 4*y*2*z* = × 4*y*2*z*

= -28*y*2*z*

Question 8 [3.6]

D

-2*x*(4 + *r*) – 5(2*r −* 8*x*) = -8*x* – 2*rx* – 10*r* + 40*x*

= 32*x* – 2*xr* – 10*r*

Question 9 [3.6]

C

5*g*2(3 − 6*h*) *+* 3(*g*2 *–* 7*h*)

=15*g*2 – 30*g*2*h* + 3*g*2 – 21*h*

=18*g*2 – 30*g*2*h* – 21*h*

Question 10 [3.7]

A

Multiple-choice total marks: 10

Short answer section

Question 11 3 marks

(a) When 3*a* – 4*b* + 5*a* + 6*b* is simplified to 8*a* + 2*b*, this is called collecting *like terms*.

(b) Writing an expression with a common factor and brackets is called *factorising* an expression.

(c) Using the distributive property to write an expression without brackets is called *expanding* an expression.

Question 12 2 marks [3.1, 3.7]

(a) Sample answers: 3*xy* − 9*x* + 5; 6 − 9*ab* + 3*c*

(b) Sample answers: 3*r* − 6 = 3(*r* – 2); 5*m* + 25 = 5(*m* + 5)

Question 13 3 marks [3.2]

|  |  |
| --- | --- |
|  | Correct solution  4*ab* – 5*a*  = 4 × -3 × -5 – 5 × -3  = 60 + 15  = 75 |

Question 14 5 marks [3.2]

(a) =   
= -3

(b) =   
= 3 ×   
= 

Question 15 5 marks [3.3]

|  |  |
| --- | --- |
| (a) Total area = 400 *× L ×W* = 400 × *L* × (*L* – 3) = 400*L*2 – 1200*L* | (b) *L* = 12 = 400 × 12 – 1200 × 12 = 43 200 cm2 |

Question 16 4 marks [3.4]

|  |  |  |
| --- | --- | --- |
| (a) 8*r* –9*r* – 5*r*2 + 3  = -*r* – 5*r*2 + 3 | (b) 6*kp* – 4 + 4*k* – 6*p*  Cannot be simplified further | (c) 12*x*3 + 2*xy* – 5*x*2 – (2*x*2 + 19*x*3) = 12*x*3 + 2*xy* – 5*x*2 – 2*x*2 – 19*x*3 = -7*x*3 – 7*x*2 + 2*xy* |

Question 17 5 marks [3.5]

|  |  |  |
| --- | --- | --- |
| (a) -5 × 3*m* × 5 *– m* = -75*m – m*  = -76*m* | (b)  *=* | (c)  =  = |

Question 18 7 marks [3.6]

(a) -3*p*(7*r* – 5)  
= -3*p* × 7*r* – 3 × -5  
= -21*pr* + 15*p*

(b) 6*x*(*y* + 2) – 4*y*(*x +* 2)  
= 6*x* × *y* + 12 × *x* – 4*y × x* – 4*y ×* 2  
= 6*xy* + 12*x* – 4*xy –* 8*y*= 2*xy* – 8*y* + 12*x*

(c) [16*x* –(6*x* – 12)] = (16*x* – 4*x* + 8)  
= (12*x* + 8)  
= 6*x* + 4

Question 19 4 marks [3.6]

(a) Area of trapezium = 0.5 (*x* + 4 + 2*x* – 4) × *x* = 0.5 × 3*x* × *x* = 1.5*x*2

(b) By trial and error:  
Where *x* = 4 cm, area = 1.5 × 42 = 24 cm2

Question 20 6 marks [3.7]

(a) 42*b*2*c*– 28*bc*2*=* 3*×*14 *× b × b × c –* 2 × 14 *× b × c × c*   
= 14*bc*(3*b* – 2c)

(b) -8*bcd* + 12*b*3*c*2*d  
=* -4*bcd* (2 –3*b*2*c*)

(c) 3*t*(2*t* – 5) – 5(2*t* – 5) = 3 × *t* × (2*t* – 5) – 5 × (2*t* – 5)  
= (2*t* – 5)(3*t* – 5)

Short answer total marks: 44

Extended answer section

Question 21 7 marks [3.1, 3.4, 3.7]

|  |  |  |
| --- | --- | --- |
| (a) $3*r* | (b) $4*r* | (c) $(4*r* – 50) |
| (d) *r* – 25 + 3*r* – 25 = $(4*r* – 50) | (e) 3*r* – 25 + 3*r  =* $(6*r* –25) | (f) 4*r* – 50 +6*r* – 25  = $(10*r* – 75) |
| (g) $5(2*r* – 15) |  |  |

Question 22 8 marks [3.6, 3.7]

(a) *A* = (*x* + 12) × *x  
= x*(*x* + 12)  
*= x*2 + 12*x*

(b) New area = 3(*x* + 12) × *  
 *

(c) ** – *x*(*x* + 12) = ** −(*x*2 + 12*x*)  
 *= * + 18*x – x*2 – 12*x  
 =  +* 6*x*

(d) ** + 6*x* = *x*(*x* + 12) or *x*(+ 6)

(e) The area has increased by half the original area.

Question 23 7 marks [3.2, 3.6]

(a) (i) Speed = distance ÷ time  
Time taken = 20 min = hour  
Speed = *x* ÷   
 = 3*x*

(ii) Speed = distance ÷ time  
Time taken = 15 min = h  
Speed = (*x +* 5) ÷   
 = 4(*x* + 5) = 4 × *x* + 4 × 5  
 = 4*x* + 20

(b) 4*x* + 20 – 3*x* = 28  
 *x* + 20 = 28  
By observation, *x* = 8  
Total distance = *x* + *x* + 5   
 = 2*x* + 5  
 = 2 × 8 + 5  
 = 21 km

Extended answer total marks: 22

TOTAL test marks: 76