

**UNIT 12** *Formulae***Revision Test 12.1**  
(Standard)

1. If  $a = 4$ ,  $b = 5$  and  $c = 7$ , calculate:

(a)  $a + b$                       (b)  $bc$                       (c)  $2a + 3c$

(4 marks)

2. Calculate:

(a)  $(-6) \times 5$                       (b)  $(-4) + 10$   
(c)  $(-25) \div (-5)$                       (d)  $3 - (-7)$

(8 marks)

3. Solve the following equations:

(a)  $x + 8 = 14$                       (b)  $4x = 44$   
(c)  $x - 7 = 9$                       (d)  $\frac{x}{4} = 3$   
(e)  $2x + 1 = 9$                       (f)  $5x - 2 = 18$

(12 marks)

4. A formula states that

$$f = u + vx$$

- (a) Calculate  $f$ , if  $u = 2$ ,  $v = 4$  and  $x = 10$ .  
(b) Calculate  $x$ , if  $f = 20$ ,  $u = 6$  and  $v = 2$ .  
(c) Calculate  $u$ , if  $f = 22$ ,  $v = 2$  and  $x = 8$ .

(6 marks)

## UNIT 12 *Formulae*

## Revision Test 12.2

(Academic)

1. If  $a = 6$ ,  $b = 7$  and  $c = -3$ , calculate:

(a)  $c^2$

(b)  $3a + 2b$

(c)  $4a - 7c$

(d)  $b(a - c)$

(7 marks)

2. Calculate:

(a)  $(-6) + (-7)$

(b)  $6 - (-9)$

(c)  $84 \div (-4)$

(6 marks)

3. Solve the following equations:

(a)  $x + 7 = 5$

(b)  $2x + 5 = 19$

(c)  $6x - 3 = 15$

(d)  $\frac{x}{7} + 2 = 4$

(e)  $3(x + 4) = 6$

(9 marks)

4. Make  $x$  the subject of each of the following formulae:

(a)  $y = 2x - 1$

(b)  $y = \frac{x}{2} + 3$

(4 marks)

5. Solve the equation  $x^3 = 20$ , correct to 1 decimal place. Show all your working.

(4 marks)

**UNIT 12** *Formulae***Revision Test 12.3**  
(Express)

1. If  $a = 12$ ,  $b = -3$  and  $c = -5$ , calculate:

(a)  $\frac{a-b}{c}$

(b)  $a(b-c)$

(c)  $3(2a+b-2c)$

(d)  $a^2 + b^2 + c^2$

(8 marks)

2. Solve the following equations:

(a)  $4x - 7 = 13$

(b)  $9x + 30 = 3x + 42$

(c)  $4(2x + 7) = 20$

(d)  $\frac{x}{4} + 12 = 7$

(8 marks)

3. Make  $x$  the subject of each of the following formulae:

(a)  $y = 4x - 8$

(b)  $y = px + q$

(c)  $r = 2(qx - t)$

(d)  $p = \frac{3x}{q} - d$

(8 marks)

4. Solve the equation

$$x^2 + x^3 = 19$$

giving your answer correct to 2 decimal places. Show all your working.

(6 marks)

## Revision Test 12.1 (Standard)

## Answers

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- |        |  |              |            |
|--------|--|--------------|------------|
| 1. (a) | $4 + 5 = 9$                                  | B1           |            |
| (b)    | $5 \times 7 = 35$                            | B1           |            |
| (c)    | $2 \times 4 + 3 \times 7 = 8 + 21$<br>$= 29$ | M1 A1        | (4 marks)  |
|        |  |              |            |
| 2. (a) | $(-6) \times 5 = -30$                        | B2           |            |
| (b)    | $(-4) + 10 = 6$                              | B2           |            |
| (c)    | $(-25) \div (-5) = 5$                        | B2           |            |
| (d)    | $3 - (-7) = 10$                              | B2           | (8 marks)  |
|        |  |              |            |
| 3. (a) | $x = 14 - 8$<br>$= 6$                        | M1 A1        |            |
| (b)    | $x = \frac{44}{4}$<br>$= 11$                 | M1 A1        |            |
| (c)    | $x = 9 + 7$<br>$= 16$                        | M1 A1        |            |
| (d)    | $x = 3 \times 4$<br>$= 12$                   | M1 A1        |            |
| (e)    | $2x = 9 - 1$<br>$2x = 8$<br>$x = 4$          | M1 A1        |            |
| (f)    | $5x - 2 = 18$<br>$5x = 20$<br>$x = 4$        | M1 A1        | (12 marks) |
|        |  |              |            |
| 4. (a) | $f = 2 + 4 \times 10$<br>$= 42$              | M1 A1        |            |
| (b)    | $20 = 6 + 2x$<br>$14 = 2x$<br>$x = 7$        | M1<br><br>A1 |            |
| (c)    | $22 = u + 16$<br>$u = 6$                     | M1<br>A1     | (6 marks)  |

**(TOTAL MARKS 30)**

## Revision Test 12.2 (Academic)

## Answers

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- |        |   |              |           |
|--------|---|--------------|-----------|
| 1. (a) | $(-3)^2 = 9$  | B1           |           |
| (b)    | $3 \times 6 + 2 \times 7 = 18 + 14$<br>$= 32$       | M1 A1        |           |
| (c)    | $4 \times 6 - 7 \times (-3) = 24 - (-21)$<br>$= 45$ | M1 A1        |           |
| (d)    | $7(6 - (-3)) = 7 \times 9$<br>$= 63$                | M1 A1        | (7 marks) |
|        |   |              |           |
| 2. (a) | $(-6) + (-7) = -13$                                 | B2           |           |
| (b)    | $6 - (-9) = 15$                                     | B2           |           |
| (c)    | $84 \div (-4) = -21$                                | B2           | (6 marks) |
|        |   |              |           |
| 3. (a) | $x = 5 - 7$<br>$= -2$                               | B1           |           |
| (b)    | $2x = 14$<br>$x = 7$                                | M1<br>A1     |           |
| (c)    | $6x = 18$<br>$x = 3$                                | M1<br>A1     |           |
| (d)    | $\frac{x}{7} = 2$<br>$x = 14$                       | M1<br>A1     |           |
| (e)    | $3x + 12 = 6$<br>$3x = -6$<br>$x = -2$              | M1<br><br>A1 | (9 marks) |
|        |   |              |           |
| 4. (a) | $y + 1 = 2x$<br>$x = \frac{y+1}{2}$                 | M1<br>A1     |           |
| (b)    | $y - 3 = \frac{x}{2}$<br>$x = 2(y - 3)$             | M1<br>A1     | (4 marks) |
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**Revision Test 12.2**

5.

$x$	$x^3$ (to 1 d.p.)	<i>Comment</i>
2	8	Too small
3	27	Too big
2.7	19.7	Too small
2.8	22.0	Too big
2.75	20.8	Too big

B3

 $x = 2.7$  to 1 d.p.

B1

*(4 marks)***(TOTAL MARKS 30)**

## Revision Test 12.3 (Express)

## Answers

1. (a)  $\frac{12 - (-3)}{-5} = \frac{15}{-5}$   
 $= -3$  M1 A1
- (b)  $12((-3) - (-5)) = 12 \times 2$   
 $= 24$  M1 A1
- (c)  $3(2 \times 12 + (-3) - 2 \times (-5)) = 3 \times 31$   
 $= 93$  M1 A1
- (d)  $12^2 + (-3)^2 + (-5)^2 = 144 + 9 + 25$   
 $= 178$  M1 A1 (8 marks)
2. (a)  $4x = 20$  M1  
 $x = 5$  A1
- (b)  $6x = 12$  M1  
 $x = 2$  A1
- (c)  $8x + 28 = 20$  M1  
 $8x = -8$   
 $x = -1$  A1
- (d)  $\frac{x}{4} = -5$  M1  
 $x = -20$  A1 (8 marks)
3. (a)  $y + 8 = 4x$  M1  
 $x = \frac{y + 8}{4}$  A1
- (b)  $y - q = px$  M1  
 $x = \frac{y - q}{p}$  A1
- (c)  $r = 2qx - 2t$  M1  
 $r + 2t = 2qx$   
 $x = \frac{r + 2t}{2q}$  A1
- (d)  $p + d = \frac{3x}{q}$  M1  
 $x = \frac{q(p + d)}{3}$  A1 (8 marks)

**Revision Test 12.3**

4.

$x$	$x^2 + x^3$ (to 1 d.p.)	<i>Comment</i>
2	12	Too small
3	36	Too big
2.3	17.45	Too small
2.4	19.58	Too big
2.37	18.93	Too small
2.38	19.15	Too big
2.375	19.04	Too big

B5

 $x = 2.37$  to 2 d.p.

B1 (6 marks)

**(TOTAL MARKS 30)**