

## UNIT 12 *Formulae*

## Overhead Slides

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- 12.1 Substitution
- 12.2 Substitution with Brackets
- 12.3 Substitution with Negative Numbers
- 12.4 Straightforward Linear Equations
- 12.5 Linear Equations
- 12.6 Cubic Equations
- 12.7 Non-Linear Equations
- 12.8 Changing the Subject of a Formula

# OS 12.1

## *Substitution*

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(A) Given that  $a = 6$ ,  $b = 7$  and  $c = 2$ , calculate:

(a)  $a + b =$

(b)  $b + c =$

(c)  $b - a =$

(d)  $b - c =$

(B) Given that  $p = 4$ ,  $q = 3$  and  $r = 5$ , calculate:

(a)  $3p =$

(b)  $4r + q =$

(c)  $\frac{p}{2} =$

(d)  $pq =$

(e)  $3r + 2q =$

**OS 12.2***Substitution with Brackets*

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Given that  $x = 2$ ,  $y = 3$  and  $z = 6$ , calculate:

(a)  $2(x + 2) =$

(b)  $4(z - x) =$

(c)  $x(y + z) =$

(d)  $5(2x + 3y) =$

(e)  $2y(x + 5z) =$

**OS 12.3***Substitution with Negative Numbers*

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Given that  $d = -2$ ,  $e = 5$  and  $f = -6$ , calculate:

(a)  $d + f =$

(b)  $e + f =$

(c)  $ef =$

(d)  $df =$

(e)  $2e + 3f =$

(f)  $4d - 2f =$

(g)  $2e(d - 2f) =$

**OS 12.4***Straightforward Linear Equations*

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(A) Solve the following linear equations:

(a)  $x + 6 = 21$

(b)  $x - 4 = 15$

(c)  $x + 12 = 19$

(d)  $x + 7 = 5$

(B) Solve the following linear equations:

(a)  $4x = 24$

(b)  $6x = 42$

(c)  $5x = 45$

(d)  $\frac{x}{4} = 3$

(e)  $\frac{x}{7} = 10$

**OS 12.5***Linear Equations*

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(A) Solve the following linear equations:

(a)  $4x + 7 = 23$

(b)  $6x - 5 = 19$

(c)  $4(2x + 1) = 28$

(d)  $6(4x - 5) = 12$

(B) Solve the following linear equations:

(a)  $4x + 2 = 6x - 4$

(b)  $7x - 6 = 9x - 16$

(c)  $\frac{a}{6} + 7 = 11$

(d)  $\frac{a + 5}{4} = 9$

## OS 12.6

*Cubic Equations*

Solve the non-linear equation  $x^3 = 50$ , using the following table:

$x$	$x^3$	<i>Comment</i>
3	27	Too low
4	64	
3.5		
3.6		
3.7		
3.65		

So   $< x <$

To one decimal place,  $x =$

## OS 12.7

*Non-Linear Equations*

Solve the non-linear equation  $x^4 - x = 10$ , using the following table:

$x$	$x^4 - x$	<i>Comment</i>
1	0	Too low
2	14	
1.8		
1.9		

So   $< x <$

To one decimal place,  $x =$

To two decimal places,  $x =$



**OS 12.8***Changing the Subject of a Formula*

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(A) Make  $x$  the subject of each formula below:

(a)  $y = 4x + 7$

(b)  $y = 3x - 5$

(c)  $p = 9(x - 2)$

(d)  $r = \frac{5x - 7}{2}$

(B) Make  $t$  the subject of each formula below:

(a)  $x = pt + q$

(b)  $r = st - v$

(c)  $p = k(t - r)$

(d)  $z = \frac{2t + w}{y}$