

SUBSTITUTION

Rules:

Same Signs

- a) neg(-) x neg(-) = pos (+)
 c) pos (+) x pos (+) = pos(+)

Different Signs

- b) neg (-) x pos (+) = neg (-)
 d) pos (+) x neg (-) = neg (-)

- 1) [June/82/1]
 Calculate the value of V in the formula

$$V = \pi^2 \left(\frac{R-r}{2} \right)^2 (R+r)$$
 where R = 22.8, r = 7.50, $\pi = 3.14$
 [7 mks]
- 2) [G/Jan/92]
 Given that x = 2, y = -5 and z = 3, find the value of
 (a) $x - 2y$
 (b) xz^2
 (c) $\frac{7x+2z}{y}$ [5 mks]
- 3) [G/Dec/92/3]
 Given that p = 2, q = -3 and r = -1 find the value of
 (a) $5p - 2q$
 (b) $pq + pr$
 (c) pr^2 [5 mks]
- 4) Jun/94/1
 Given that a = 4, b = -2 and c = 3
 Calculate the value of $\frac{a^2 - bc}{b + c}$
 [2 mks]
- 5) [Jun/97/2]
 Given that m = -3, n = 2, p = -1
 find the value of $\frac{m(p-n)^2}{3p+m}$
 [4 mks]
- 6) [Jan/00/1]
 If l = -2, n = -3 and m = 4, calculate the value of $\frac{m+nl}{n-m}$ [2 mks]
- 7) [Jan/92/2]
 Given that a = 4, b = -3 and c = 12
 Calculate the value of $a^2(2b-c)$
 [2mks]
- 8) [Jun/96/2]
 Given that l = -2, m = 3, n = 7
 calculate the value of $lm(m-n)$ [2 mks]
- 9) [Jan/98/2]
 Find the value of p, if 3 is a root of
 $5x^2 - px - 18 = 0$
 [3mks]
- 10) [Jan/02/2]
 If a = 4, b = -2 and c = 3
 calculate the value of $\frac{a(b-c)}{bc}$
 [2 mks]

- 11) [Jun/03/2]
Given $a = 2$, $b = -3$ and $c = 0$, evaluate
(i) $4a - 2b + 3c$
(ii) a^c [3 mks]

- 17) [G/Dec/91]
Given that $(x + y) = 7$ and $(x - y) = -3$
find the value of $(x^2 - y^2)$
[2 mks]

- 12) [Jan/04/2]
If $p = 5$, $q = 0$ and $r = -3$, calculate using the formula
i) $4p - qr$
ii) $2r^3$

- 18) [Jun/97/2]
Given that $4p^2 - 4q^2 = 2r$ and that
 $p + q = r$ show that $p - q = \frac{1}{2}$

- 13) [Jan/05/2a]
Given that $r = \frac{2p^2}{q - 3}$

Calculate the value of r when $p = 6$ and $q = 12$
[2 mks]

- 14) [Jun/05/4]
Using the formula

$$t = \sqrt{\frac{5m}{12n}}$$

Calculate the value of t when $m = 20$ and $n = 48$

- 15) [Jan/89/9]
Given that $x^2 - y^2 = 144$
and $x + y = 9$
determine the values of
(i) $x - y$
(ii) $x^2 + y^2 - 2xy$

- 16) [G/Jun/91/22]
Given that $a^2 - b^2 = 96$ and $a + b = 16$
find the value of $a - b$. [2 mks]