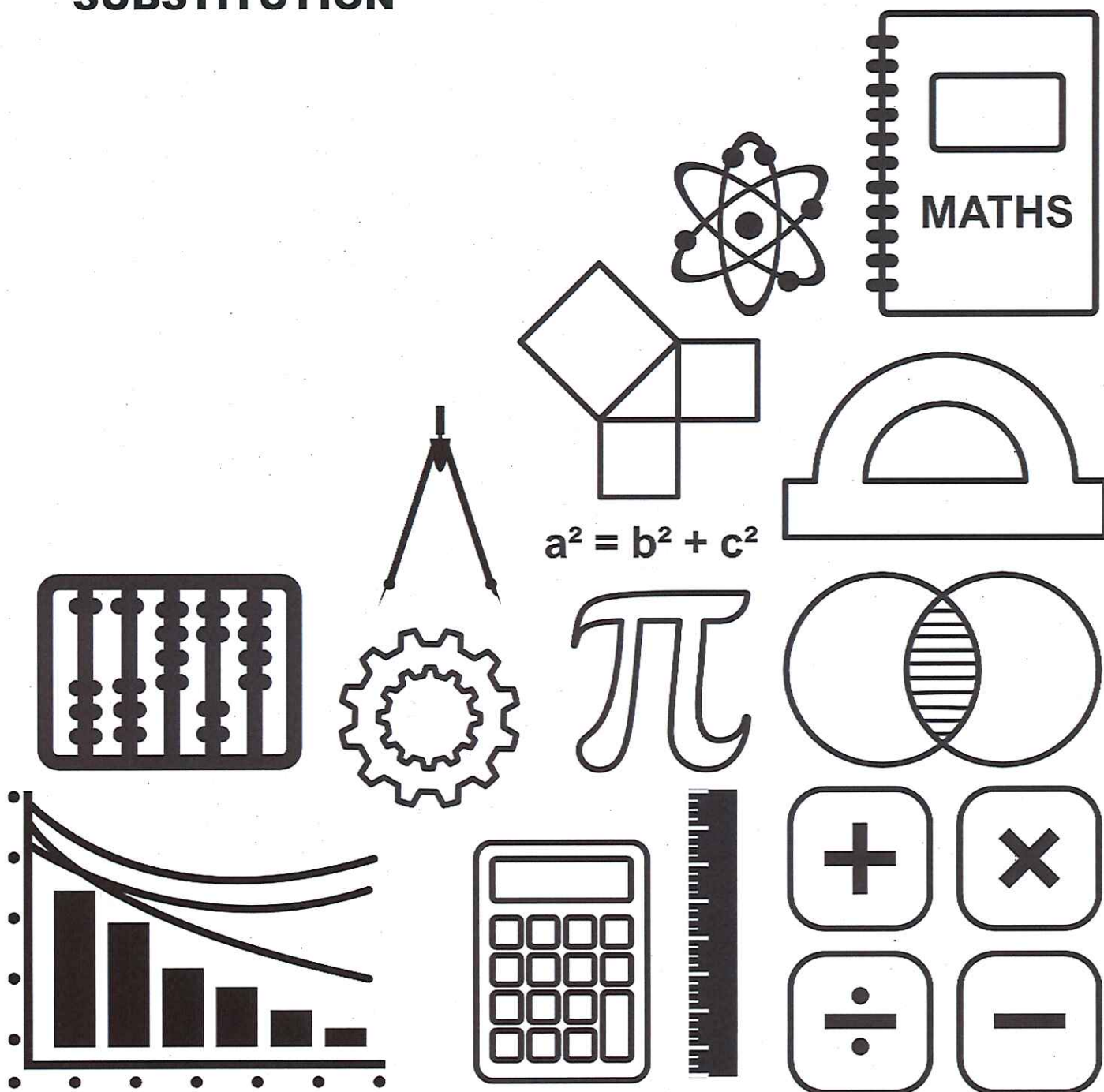


MATHSDIY

GCSE TOPIC BOOKLET SUBSTITUTION

SOLUTIONS



1. Find the value of $3x + 5y$ when $x = 4$ and $y = -6$.

$$= 3(4) + 5(-6)$$

$$= 12 - 30 = \underline{\underline{-18}}$$

(2)

2. Find the value of $5x + 4y$ when $x = -3$ and $y = -2$.

$$= 5(-3) + 4(-2)$$

$$= -15 - 8 = \underline{\underline{-23}}$$

(2)

3. What is the value of $4a - 6b$ when $a = -5$ and $b = 2$?

$$= 4(-5) - 6(2)$$

$$= -20 - 12 = \underline{\underline{-32}}$$

(2)

4. What is the value of $5a + 3b$ when $a = 2$ and $b = -4$?

$$= 5(2) + 3(-4)$$

$$= 10 - 12 = \underline{\underline{-2}}$$

(2)

5. What is the value of $6d - 7e$ when $d = -3$ and $e = 2$?

$$= 6(-3) - 7(2)$$

$$= -18 - 14 = \underline{\underline{-32}}$$

(2)

6. Find the value of $4c - 3d$ when $c = -2$ and $d = 6$.

$$= 4(-2) - 3(6)$$

$$= -8 - 18 = \underline{\underline{-26}}$$

(2)

7. Find the value of $2a + 5b - 6c$ when $a = 2$ and $b = 4$ and $c = \frac{1}{3}$.

$$= 2(2) + 5(4) - 6\left(\frac{1}{3}\right)$$

$$= 4 + 20 - 2 = 22$$

(2)

8. Find the value of $3a - b + 4c$ when $a = 3$ and $b = -1$ and $c = \frac{1}{2}$.

$$= 3(3) - (-1) + 4\left(\frac{1}{2}\right)$$

$$= 9 + 1 + 2 = 12$$

(2)

9. Find the value of $p - 2q - 6r$ when $p = 2$ and $q = 4$ and $r = \frac{1}{2}$.

$$= 2 - 2(4) - 6\left(\frac{1}{2}\right)$$

$$= 2 - 8 - 3 = -9$$

(2)

10. Find the value of $x - y - 4z$ when $x = 9$ and $y = 3$ and $z = \frac{1}{2}$.

$$= 9 - 3 - 4\left(\frac{1}{2}\right)$$

$$= 6 - 2 = 4$$

(2)

11. Find the value of $x^2 - 2y$ when $x = 9$ and $y = 3$.

$$= 9^2 - 2(3)$$

$$= 81 - 6 = 75$$

(2)

12. Find the value of $4x^3$ when $x = -2$.

$$= 4 \times (-2)^3$$

$$= 4 \times (-8) = -32$$

13. Find the value of $2(a - 5b) - c$ when $a = 3$ and $b = 2$ and $c = 4$.

$$\begin{aligned}
 &= 2(3 - 5(2)) - 4 \\
 &= 2(3 - 10) - 4 \\
 &= 2(-7) - 4 \\
 &= -14 - 4 = \underline{\underline{-18}}
 \end{aligned}$$

(2)

14. Find the value of $a^2 - b^2 + 3c$ when $a = 3$ and $b = -1$ and $c = \frac{1}{2}$.

$$\begin{aligned}
 &= 3^2 - (-1)^2 + 3\left(\frac{1}{2}\right) \\
 &= 9 - 1 + 1\frac{1}{2} = \underline{\underline{9\frac{1}{2}}}
 \end{aligned}$$

(2)

15. Given that $a = -6$ and $b = 3$ and $c = 4$, find the value of each of the following expressions.

a) $\frac{a^2}{4} - a = \frac{(-6)^2}{4} - (-6)$

$$\begin{aligned}
 &= \frac{36}{4} + 6 = 9 + 6 = \underline{\underline{15}}
 \end{aligned}$$

(2)

b) $2b^3 = 2(3)^3$

$$\begin{aligned}
 &= 2 \times 27 \\
 &= \underline{\underline{54}}
 \end{aligned}$$

(2)

c) $\frac{8.5a+b}{c} = \frac{8.5(-6) + 3}{4}$

$$\begin{aligned}
 &= \frac{-48 + 3}{4} = \underline{\underline{-12}}
 \end{aligned}$$

(2)

16. Given that $k = -3$ and $m = 7$ and $p = 10$, find the value of the following expressions.

$$\begin{aligned} \text{a) } \frac{5(k^2 - m)}{p} &= \frac{5((-3)^2 - 7)}{10} \\ &= \frac{5(9 - 7)}{10} = \frac{10}{10} = \underline{\underline{1}} \end{aligned}$$

(2)

$$\begin{aligned} \text{b) } (2m)^3 &= (2 \times 7)^3 \\ &= 14^3 \\ &= \underline{\underline{2744}} \end{aligned}$$

(2)

$$\begin{aligned} \text{c) } \frac{6(p^2 - 10m)}{k} &= \frac{6((10)^2 - (10 \times 7))}{-3} \\ &= \frac{6(100 - 70)}{-3} = \frac{180}{-3} = \underline{\underline{-60}} \end{aligned}$$

(3)

$$\begin{aligned} \text{d) } (2k)^3 &= (2 \times -3)^3 \\ &= (-6)^3 \\ &= \underline{\underline{-216}} \end{aligned}$$

(2)

$$\begin{aligned} \text{e) } \frac{6m(k^2 - p)}{k} &= \frac{(6 \times 7)((-3)^2 - 10)}{-3} \\ &= \frac{42(-1)}{-3} = \underline{\underline{14}} \end{aligned}$$

(3)