

Substitution

Starter

1. **(Review of previous material)** Let $x = -5$ and $y = 3$. Find the value of:

(a) $7y - 3x$ (b) $-\frac{8x}{7y}$ (c) $2x^2 - 9y^2$

Working: (a) $7y - 3x = 7 \times 3 - 3 \times (-5) = 21 + 15 = 36$

(b) $-\frac{8x}{7y} = -\frac{8 \times (-5)}{7 \times 3} = -\frac{-40}{21} = \frac{40}{21}$

(c) $2x^2 - 9y^2 = 2 \times (-5)^2 - 9 \times 3^2 = 2 \times 25 - 9 \times 9 = 50 - 81 = -31$

E.g.1 Let $a = 4$, $b = -2$ and $c = -3$. Find the value of:

(a) $a(b + c)$ (b) $a^2(b - c)$ (c) $\frac{2c(a - c)}{b^2 + \frac{2c}{a}}$
 (d) $b^2(2a + 3c)$ (e) $\sqrt{ab + c^2}$ (f) $\frac{b^2}{a} + \frac{2c}{b}$

Working: (a) $a(b + c) = 4((-2) + (-3)) = 4 \times (-5) = -20$

(b) $a^2(b - c) = 4^2((-2) - (-3)) = 16 \times (-2 + 3) = 16 \times 1 = 16$

(c) $2c(a - c) = 2 \times (-3)(4 - (-3)) = -6(4 + 3) = -6 \times 7 = -42$

(d) $b^2(2a + 3c) = (-2)^2(2 \times 4 + 3 \times (-3)) = 4(8 - 9) = 4 \times (-1) = -4$

(e) $\sqrt{ab + c^2} = \sqrt{4 \times (-2) + (-3)^2} = \sqrt{-8 + 9} = \sqrt{1} = \pm 1$

(f) $\frac{b^2}{a} + \frac{2c}{b} = \frac{(-2)^2}{4} + \frac{2 \times (-3)}{(-2)} = \frac{4}{4} + \frac{-6}{-2} = 1 + 3 = 4$

Video: [Substitution](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p97 M4.1 Qu 17-47 odd
 A*-G class textbook: p89 M4.1 Qu 17-45 odd
 9-1 homework book: p32 M4.1 Qu 1-39 odd
 A*-G homework book: p24 M4.1 Qu 1-39 odd