

Outcome 2 - Substitution

Bronze examples...

Examples...

If $a = 5$, $b = 6$ and $c = 1$,
calculate:- **Replace a with 5 and c with 1**

$$a + c = 5 + 1 = 6$$

**9a means $9 \times a$ **

$$9a = 9 \times 5 = 45$$

**3bc means $3 \times b \times c$ **

$$3bc = 3 \times 6 \times 1 = 18$$

Silver examples

Examples...

If $a = 4$, $b = 5$ and $c = 3$,
calculate :-

$$2a + 3c = 2 \times 4 + 3 \times 3 = 17$$

$$2bc \div 10 = 2 \times 5 \times 3 \div 10$$

$$= 30 \div 10 = 3$$

$$\frac{a+b}{2} = \frac{4+5}{2} = \frac{9}{2} = 4.5$$

Gold examples

Examples...

If $a = -4$, $b = 16$ and $c = -2$,
calculate:- **To square a number means to multiply it by itself**

$$a^2 + c^2 = (-4) \times (-4) + (-2) \times (-2)$$

$$= 16 + 4 = 20$$

To cube a number means to multiply it by itself 3 times

$$5c^3 = 5 \times (-2) \times (-2) \times (-2) = -40$$

**What number do I square to get 16? **

$$\sqrt{b} = \sqrt{16} = 4$$

Bronze Questions

If $a = 10$, $b = 20$ and $c = 30$, calculate:-

- | | |
|---------------|-----------|
| 1 $a + b$ | 2 $b + c$ |
| 3 $a + b + c$ | 4 $c - a$ |
| 5 $a + b - c$ | 6 $2b$ |
| 7 $7c$ | 8 ab |
| 9 bc | 10 $3abc$ |

Silver Questions

If $a = 6$, $b = 5$ and $c = 8$, calculate:-

- | | |
|----------------------|------------------------|
| 1 $4a + 5b$ | 2 $9b - 3c$ |
| 3 $5a + 2b - c$ | 4 $7bc - 6a$ |
| 5 $3ac \div 10$ | 6 $8ab \div 2$ |
| 7 $\frac{b+c}{10}$ | 8 $\frac{ac}{2}$ |
| 9 $5 - \frac{1}{2}a$ | 10 $11 - \frac{1}{5}b$ |

Gold Questions

If $a = -4$, $b = 25$ and $c = -1$, calculate:-

- | | |
|---------------|---------------|
| 1 $4a + b$ | 2 $6c - 3$ |
| 3 $2a + 3b$ | 4 $5b - 4c$ |
| 5 a^2 | 6 c^3 |
| 7 $3c^2$ | 8 $2a^3$ |
| 9 $b^2 + c^2$ | 10 $\sqrt{b}$ |

Bronze Answers

- | | | | |
|----|-----|-----|-----|
| 1. | 30 | 2. | 50 |
| 3. | 60 | 4. | 20 |
| 5. | 0 | 6. | 40 |
| 7. | 210 | 8. | 200 |
| 9. | 600 | 10. | 900 |

Silver Answers

- | | | | |
|----|------|-----|-----|
| 1. | 49 | 2. | 21 |
| 3. | 32 | 4. | 244 |
| 5. | 14.4 | 6. | 120 |
| 7. | 1.3 | 8. | 24 |
| 9. | 2 | 10. | 10 |

Gold Answers

- | | | | |
|----|----|-----|------|
| 1. | 9 | 2. | -9 |
| 3. | 67 | 4. | 129 |
| 5. | 16 | 6. | -1 |
| 7. | 3 | 8. | -128 |
| 9. | 17 | 10. | 5 |