

**ALGEBRA: SUBSTITUTION & CHANGING THE SUBJECT****Best Guess Mastery Worksheet (Target Grade 4/5)****I Do**

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$$v = u + at$$

$$u = 15, a = -3, t = 4$$

Work out the value of  $v$ .

**We Do**

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$$v = u + at$$

$$u = 20, a = -4, t = 3$$

Work out the value of  $v$ .

**ALGEBRA: SUBSTITUTION & CHANGING THE SUBJECT****Best Guess Mastery Worksheet (Target Grade 4/5)****You Do 1**

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$$v = u + at$$

$$u = 8, a = 6, t = 5$$

Work out the value of  $v$ .

**You Do 2**

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$$s = ut + \frac{1}{2}at^2$$

$$u = 5, a = 4, t = 3$$

Work out the value of  $s$ .

**ALGEBRA: SUBSTITUTION & CHANGING THE SUBJECT****Best Guess Mastery Worksheet (Target Grade 4/5)****You Do 3**

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$$v^2 = u^2 + 2as$$

$$u = 3, a = 2, s = 10$$

Work out the positive value of  $v$ .

**You Do 4**

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$$s = \frac{1}{2}(u + v)t$$

$$u = 14, v = 26, t = 8$$

Work out the value of  $s$ .

**ALGEBRA: SUBSTITUTION & CHANGING THE SUBJECT****Best Guess Mastery Worksheet (Target Grade 4/5)****Challenge 1**

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(a) Make  $t$  the subject of the formula  $v = u + at$

(b) Make  $s$  the subject of the formula  $v^2 = u^2 + 2as$

**Challenge 2**

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(a) Make  $a$  the subject of the formula  $s = ut + \frac{1}{2}at^2$

(b) Make  $v$  the subject of the formula  $s = \frac{1}{2}(u + v)t$

**Answers & Worked Solutions****I Do:**

$$v = 15 + (-3 \times 4)$$

$$v = 15 - 12$$

$$v = 3$$

**We Do:**

$$v = 20 + (-4 \times 3)$$

$$v = 20 - 12$$

$$v = 8$$

**You Do 1:**

$$v = 8 + (6 \times 5)$$

$$v = 8 + 30$$

$$v = 38$$

**You Do 2:**

$$s = (5 \times 3) + 0.5 \times 4 \times (3^2)$$

$$s = 15 + (0.5 \times 4 \times 9)$$

$$s = 15 + 18$$

$$s = 33$$

**You Do 3:**

$$v^2 = 3^2 + 2 \times 2 \times 10$$

$$v^2 = 9 + 40 = 49$$

$$v = \sqrt{49} = 7$$

**You Do 4:**

$$s = 0.5 \times (14 + 26) \times 8$$

$$s = 0.5 \times 40 \times 8$$

$$s = 20 \times 8 = 160$$

**Challenge 1:**

$$(a) v = u + at \rightarrow v - u = at \rightarrow t = (v - u) / a$$

$$(b) v^2 = u^2 + 2as \rightarrow v^2 - u^2 = 2as \rightarrow s = (v^2 - u^2) / 2a$$

**Challenge 2:**

$$(a) s = ut + \frac{1}{2}at^2 \rightarrow s - ut = \frac{1}{2}at^2 \rightarrow 2(s - ut) = at^2 \rightarrow a = 2(s - ut) / t^2$$

$$(b) s = \frac{1}{2}(u + v)t \rightarrow 2s = (u + v)t \rightarrow 2s / t = u + v \rightarrow v = (2s / t) - u$$