



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Standard Form · Practice Booklet

NAME:

CLASS:

DATE:

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Standard Form

Total marks available: 110

● Standard Form

✓ 2.4×10^2

Q1 · ● Developing · 3 marks

METHOD

$$4 \times 6 = 24, 3 + (-2) = 1$$

24×10^1 is not in standard form since the coefficient ≥ 10 , so rewrite as 2.4×10^2

✓ 3.157×10^{-3}

Q2 · ● Developing · 3 marks

METHOD

$$7.7 \times 4.1 = 31.57, -2 + (-2) = -4$$

31.57×10^{-4} is not in standard form since the coefficient ≥ 10 , so rewrite as 3.157×10^{-3}

✓ 5.859×10^6

Q3 · ● Developing · 3 marks

METHOD

$$6.3 \times 9.3 = 58.59, 1 + 4 = 5$$

58.59×10^5 is not in standard form since the coefficient ≥ 10 , so rewrite as 5.859×10^6

✓ 4.466×10^0

Q4 · ● Developing · 3 marks

METHOD

$$5.8 \times 7.7 = 44.66, 1 + (-2) = -1$$

44.66×10^{-1} is not in standard form since the coefficient ≥ 10 , so rewrite as 4.466×10^0

✓ 3.724×10^6

Q5 · ● Developing · 3 marks

METHOD

$$4.9 \times 7.6 = 37.24, 6 + (-1) = 5$$

37.24×10^5 is not in standard form since the coefficient ≥ 10 , so rewrite as 3.724×10^6

✓ 4.95×10^8

Q6 · ● Developing · 3 marks

METHOD

$$5.5 \times 9 = 49.5, 5 + 2 = 7$$

49.5×10^7 is not in standard form since the coefficient ≥ 10 , so rewrite as 4.95×10^8

✓ 2.62×10^{-5}

Q7 · ● Developing · 3 marks

METHOD

$$9.69 \div 3.7 = 2.6189..., -3 - 2 = -5$$

$$2.6189... \times 10^{-5} = 2.62 \times 10^{-5} \text{ (3 s.f.)}$$

✓ 4.23×10^{-5}

Q8 · ● Developing · 3 marks

METHOD

$$2.37 \div 5.6 = 0.4232..., -2 - 2 = -4$$

$$0.4232... \times 10^{-4} = 4.23 \times 10^{-5} \text{ (3 s.f.)}$$

✓ 4.91×10^{-8}

Q9 · ● Developing · 3 marks

METHOD

$$2.26 \div 4.6 = 0.4913..., -3 - 4 = -7$$

$$0.4913... \times 10^{-7} = 4.91 \times 10^{-8} \text{ (3 s.f.)}$$

✓ 6.888×10^3

Q10 · ● Developing · 3 marks

METHOD

$$8.2 \times 8.4 = 68.88, 2 + 0 = 2$$

68.88×10^2 is not in standard form since the coefficient ≥ 10 , so rewrite as 6.888×10^3

✓ $4.59 \times 10^1 \text{ km/h}$

Q11 · ● Secure · 4 marks

METHOD

Speed = distance ÷ time

$$3.9 \div 8.5 = 0.4588..., 7 - 5 = 2$$

$$0.4588... \times 10^2 = 4.59 \times 10^1 \text{ km/h (3 s.f.)}$$

✓ 8.21×10^4

Q12 · ● Secure · 4 marks

METHOD

Align powers of 10 first: $6.9 \times 10^3 = 0.69 \times 10^4$

$$(8.9 + 0.69) \times 10^4 = 8.21 \times 10^4$$

✓ $1.72 \times 10^6 \text{ km/h}$

Q13 · ● Secure · 4 marks

METHOD

Speed = distance ÷ time

$$7.4 \div 4.3 = 1.7209..., 11 - 5 = 6$$

$$1.7209... \times 10^6 = 1.72 \times 10^6 \text{ km/h (3 s.f.)}$$

✓ $8.27 \times 10^6 \text{ km/h}$

Q14 · ● Secure · 4 marks

METHOD

Speed = distance ÷ time

$$4.3 \div 5.2 = 0.8269..., 10 - 3 = 7$$

$$0.8269... \times 10^7 = 8.27 \times 10^6 \text{ km/h (3 s.f.)}$$

✓ 8.554×10^5

Q15 · ● Secure · 4 marks

METHOD

Align powers of 10 first: $5.4 \times 10^3 = 0.054 \times 10^5$

$$(8.5 + 0.054) \times 10^5 = 8.554 \times 10^5$$

✓ 2.7085×10^5

Q16 · ● Secure · 4 marks

METHOD

Align powers of 10 first: $8.5 \times 10^2 = 0.0085 \times 10^5$
 $(2.7 + 0.0085) \times 10^5 = 2.7085 \times 10^5$

✓ 4.54×10^3 km/h

Q17 · ● Secure · 4 marks

METHOD

Speed = distance ÷ time
 $5.9 \div 1.3 = 4.5385...$, $6 - 3 = 3$
 $4.5385... \times 10^3 = 4.54 \times 10^3$ km/h (3 s.f.)

✓ 2.98×10^5

Q18 · ● Secure · 4 marks

METHOD

Align powers of 10 first: $1.2 \times 10^4 = 0.12 \times 10^5$
 $(3.1 - 0.12) \times 10^5 = 2.98 \times 10^5$

✓ 2.00×10^6 km/h

Q19 · ● Secure · 4 marks

METHOD

Speed = distance ÷ time
 $4 \div 2 = 2$, $7 - 1 = 6$
 $2 \times 10^6 = 2.00 \times 10^6$ km/h (3 s.f.)

✓ 1.861×10^9

Q20 · ● Secure · 4 marks

METHOD

Align powers of 10 first: $6.1 \times 10^7 = 0.061 \times 10^9$
 $(1.8 + 0.061) \times 10^9 = 1.861 \times 10^9$

✓ 1.728×10^{15}

Q21 · ● Greater Depth · 4 marks

METHOD

$(1.2)^3 = 1.728, 5 \times 3 = 15$

✓ $n = 0$

Q22 · ● Greater Depth · 4 marks

METHOD

Coefficients: $3 \div 5 = 0.6$, which in standard form is 6×10^{-1}

So $4 - n - 1 = 3$

$n = 0$

✓ $n = 2$

Q23 · ● Greater Depth · 4 marks

METHOD

Coefficients: $3.75 \div 2.5 = 1.5$, which in standard form is 1.5×10^0

So $6 - n = 4$

$n = 2$

✓ 8.41×10^6

Q24 · ● Greater Depth · 4 marks

METHOD

$(2.9)^2 = 8.41, 3 \times 2 = 6$

✓ 1.96×10^6

Q25 · ● Greater Depth · 4 marks

METHOD

$(1.4)^2 = 1.96, 3 \times 2 = 6$

$\checkmark n = 2$

Q26 · ● Greater Depth · 4 marks

METHOD

Coefficients: $1.8 \div 1.5 = 1.2$, which in standard form is 1.2×10^0 So $5 - n = 3$

$$n = 2$$

$\checkmark n = 2$

Q27 · ● Greater Depth · 4 marks

METHOD

Coefficients: $3.2 \div 2 = 1.6$, which in standard form is 1.6×10^0 So $2 - n = 0$

$$n = 2$$

$\checkmark n = 1$

Q28 · ● Greater Depth · 4 marks

METHOD

Coefficients: $5.4 \div 1.5 = 3.6$, which in standard form is 3.6×10^0 So $5 - n = 4$

$$n = 1$$

$\checkmark n = 3$

Q29 · ● Greater Depth · 4 marks

METHOD

Coefficients: $12.8 \div 4 = 3.2$, which in standard form is 3.2×10^0 So $5 - n = 2$

$$n = 3$$

$\checkmark 2.4389 \times 10^{16}$

Q30 · ● Greater Depth · 4 marks

METHOD

$$(2.9)^3 = 24.389, 5 \times 3 = 15$$

$$24.389 \times 10^{15} = 2.4389 \times 10^{16}$$