Practical Maths for Electrical Installation Students & Apprentices

Homework Pack – Student Version (Units 1–10)

Unit 1 – Basic Operations

Complete all questions. Show your working where possible.

Section A – Core Skills

1. 18 + 27

_____

2. 90 – 46

_____

3. 8 × 9

_____

4. 81 ÷ 9

_____

5. (12 + 8) × 3

_____

Section B – Application

1. Add loads: 120 W + 250 W + 330 W

_____

2. Total cable length: 12 m + 18 m + 25 m

_____

3. A circuit has 96 W split equally across 12 lamps. Power per lamp?

_____

4. Multiply: 7 × 11

_____

5. Subtract: 100 − 63

_____

Section C – Challenge

1. (25 + 15) × 4 − 20

_____

2. 144 ÷ (6 × 2)

_____

3. Evaluate: 37 + 58 − 19

_____

Unit 2 – Fractions

Complete all questions. Show your working where possible.

Section A – Core Skills

1. 2/3 + 1/6

_____

2. 5/8 − 1/4

_____

3. 3/5 × 2/3

_____

4. 7/9 ÷ 7/3

_____

5. Simplify 9/12

_____

Section B – Application

1. A cable length is 3/4 m and you add 1/8 m. Total length?

_____

2. A job uses 2/5 of a roll and then 1/5 more. Total used?

_____

3. Multiply: 4/9 × 3

_____

4. Divide: 5/6 ÷ 5

_____

5. Convert 3/4 to decimal

_____

Section C – Challenge

1. 1/5 + 3/10

_____

2. 7/8 − 3/8

_____

3. 3/4 × 8/3

_____

Unit 3 – Decimals

Complete all questions. Show your working where possible.

Section A – Core Skills

1. 0.8 + 0.45

_____

2. 2.4 − 1.1

_____

3. 3.2 × 2

_____

4. 4.8 ÷ 1.2

_____

5. Round 7.356 to 2 dp

_____

Section B – Application

1. Add currents: 1.25 A + 0.75 A

_____

2. Subtract: 6.0 − 2.4

_____

3. Multiply: 2.2 × 4

_____

4. Divide: 9.6 ÷ 3

_____

5. Convert 3/4 to decimal

_____

Section C – Challenge

1. 1.75 + 2.35

_____

2. 5.6 × 1.5

_____

3. 8.4 ÷ 0.7

_____

Unit 4 – Percentages

Complete all questions. Show your working where possible.

Section A – Core Skills

1. 30% of 90

_____

2. 12% of 250

_____

3. 40% of 70

_____

4. 18% of 50

_____

5. 10% of 360

_____

Section B – Application

1. Increase £150 by 20%

_____

2. Decrease 80 W by 25%

_____

3. Increase 60 A by 50%

_____

4. Decrease 200 V by 15%

_____

5. 5% of 120

_____

Section C – Challenge

1. A value increases from 120 to 150. % increase?

_____

2. A value decreases from 200 to 170. % decrease?

_____

3. Find x if 25% of x = 35

_____

Unit 5 – Ratios

Complete all questions. Show your working where possible.

Section A – Core Skills

1. Simplify 12:18

_____

2. Simplify 6:15

_____

3. Simplify 20:4

_____

4. Simplify 14:21

_____

5. Simplify 8:12

_____

Section B – Application

1. Divide 48 in ratio 2:2

_____

2. Divide 60 in ratio 4:2

_____

3. Split £90 in ratio 3:2

_____

4. Divide 72 in ratio 5:3

_____

5. Split 150 in ratio 1:2

_____

Section C – Challenge

1. Divide 36 in ratio 1:5

_____

2. A mixture is 2:3 and totals 100. Find parts

_____

3. Scale ratio 3:4 up to total 56

_____

Unit 6 – Powers (Indices)

Complete all questions. Show your working where possible.

Section A – Core Skills

1. 3^3

_____

2. 6^2

_____

3. 4^3

_____

4. 9^2

_____

5. 5^3

_____

Section B – Application

1. 2^5

_____

2. 7^2

_____

3. 10^2

_____

4. 8^2

_____

5. 11^2

_____

Section C – Challenge

1. 2^3 × 2^2

_____

2. 3^4 ÷ 3^2

_____

3. (4^2)^2

_____

Unit 7 – SI Units

Complete all questions. Show your working where possible.

Section A – Core Skills

1. Convert 3 kW to W

_____

2. Convert 2500 m to km

_____

3. Convert 750 g to kg

_____

4. Convert 1.5 m to mm

_____

5. Convert 2 A to mA

_____

Section B – Application

1. Convert 0.8 kV to V

_____

2. Convert 500 W to kW

_____

3. Convert 12 cm to mm

_____

4. Convert 1.2 kg to g

_____

5. Convert 50 mm to m

_____

Section C – Challenge

1. Convert 2.5 MW to W

_____

2. Convert 0.006 km to m

_____

3. Convert 0.004 kg to g

_____

Unit 8 – Algebra

Complete all questions. Show your working where possible.

Section A – Core Skills

1. x + 7 = 15

_____

2. 3x = 18

_____

3. x − 4 = 9

_____

4. 5x = 35

_____

5. x/3 = 5

_____

Section B – Application

1. x + 12 = 25

_____

2. 6x = 24

_____

3. x − 8 = 2

_____

4. x/4 = 6

_____

5. 2x + 6 = 14

_____

Section C – Challenge

1. $3x + 5 = 20$

_____

2. $2(x + 4) = 18$

_____

3. $5x - 10 = 2x + 11$

_____

Unit 9 – Transposition of Formulae

Complete all questions. Show your working where possible.

Section A – Core Skills

1. Rearrange $P = VI$ for I

_____

2. Rearrange $F = ma$ for m

_____

3. Rearrange $A = bh$ for h

_____

4. Rearrange $y = mx + c$ for m

_____

5. Rearrange $Q = It$ for t

_____

Section B – Application

1. Rearrange d = vt for v

_____

2. Rearrange V = IR for R

_____

3. Rearrange P = I^2R for I

_____

4. Rearrange E = mc^2 for m

_____

5. Rearrange y = mx + c for c

_____

Section C – Challenge

1. Rearrange P = VI for V

_____

2. Rearrange d = vt for t

_____

3. Rearrange V = IR for V

_____

Unit 10 – Trigonometry & Pythagoras

Complete all questions. Show your working where possible.

Section A – Core Skills

1. Find hypotenuse of 5 and 12

_____

2. Find hypotenuse of 8 and 15

_____

3. sin 45°

_____

4. cos 30°

_____

5. tan 60°

_____

Section B – Application

1. Find opposite if hyp=10 and $\sin\theta=0.6$

_____

2. Find adjacent if hyp=13 and $\cos\theta=5/13$

_____

3. Find hypotenuse using 9 and 12

_____

4. Find angle if $\tan\theta=1$

_____

5. Triangle with sides 7 and 24: find hypotenuse

_____

Section C – Challenge

1. Find θ if $\sin\theta = 0.8$

_____

2. Find θ if $\cos\theta = 0.5$

_____

3. Find θ if $\tan\theta = \sqrt{3}$

_____