# Answers and mark guide

| Q | Answer | Working | Marks |
|---|---|---|---|
| 1 | **5 cm** | $3^2+4^2=25$, so hypotenuse = 5 cm. | 1 |
| 2 | **13 cm** | 25+144=169; √169=13. | 2 |
| 3 | **8 cm** | 100−36=64; √64=8. | 2 |
| 4 | **11.4 cm** | 49+81=130; √130=11.40… | 2 |
| 5 | **60 cm²** | Other side: 289−64=225, so 15 cm. Area=½×8×15=60. | 3 |
| 6 | **Yes** | $9^2+12^2=81+144=225=15^2$, so Pythagoras holds: right-angled. | 2 |
| 7 | **No** | 64+100=164 but $13^2=169$. Not equal, so not right-angled. | 2 |
| 8 | **6 m** | 42.25−6.25=36; √36=6 m. | 3 |
| 9 | **17 cm** | 225+64=289; √289=17. | 2 |
| 10 | **7.07 cm** | $2s^2=100$, $s^2=50$, s=√50=7.071… | 3 |
| 11 | **(a) 15 km (b) 6 km** | (a) 144+81=225, so 15 km. (b) 21−15=6 km. | 4 |
| 12 | **10 units** | Differences: 6 and 8. 36+64=100; √100=10. | 3 |
| 13 | **7.21** | Differences: 6 and 4 (ignore signs after subtracting). 36+16=52; √52=7.211… | 3 |
| 14 | **(a) 12 cm (b) 60 cm²** | (a) Half base 5: 169−25=144, height 12. (b) ½×10×12=60. | 5 |
| 15 | **43.3 cm²** | Height: 100−25=75, so √75=8.660… Area=½×10×8.660…=43.30… (exact: 25√3). | 4 |
| 16 | **112 cm²** | Each overhang=(20−8)÷2=6. Height: 100−36=64, so 8. Area=½(20+8)×8=112. | 5 |
| 17 | **x = 5** | $x^2+(x+7)^2=169 \rightarrow 2x^2+14x-120=0 \rightarrow x^2+7x-60=0$. Factorise: (x+12)(x−5)=0. x=5 (reject −12 as a length). | 5 |
| 18 | **13 cm** | Space diagonal: 9+16+144=169; √169=13. | 4 |
| 19 | **6 cm** | The perpendicular from the centre bisects the chord. 100−64=36; √36=6. | 4 |
| 20 | **Proof; 15, 8, 17** | $(n^2-1)^2+(2n)^2=n^4-2n^2+1+4n^2=n^4+2n^2+1=(n^2+1)^2$, so Pythagoras holds. n=4: 15, 8, 17. | 5 |

**My score: _____ / 64** Questions 1–15 = 41 marks (Foundation focus)