MASTER MATHS GCSE

GCSE Mathematics 9-1

Estimation and Approximation

(Non-Calculator)

Mark Scheme

Total available marks: 29

Q	Answer	Working	Mark
1	225	Round each number to 1 significant figure: 90 × 5 ÷ 2 = 450 ÷ 2	1
2	266.6… *Also accept any answer from 260 to 270*	Round to 1 s.f.: 80 × 10 ÷ 3 = 800 ÷ 3	1
3	142.8… *Also accept any answer from 140 to 150*	Round to 1 s.f.: 20 × 50 ÷ 7 = 1000 ÷ 7	1
4	3600	Round to 1 s.f.: 600 × 3 ÷ 0.5 = 1800 ÷ 0.5	1
5	3.6	Round to 1 s.f.: 200 × 0.09 ÷ 5 = 18 ÷ 5	1
6	2700	Round to 1 s.f.: 900 × 3 ÷ 1 = 2700 ÷ 1	1
7	2000 *Also accept 2500 (from 40 × 250 ÷ 4)*	Round to 1 s.f.: 40 × 200 ÷ 4 = 8000 ÷ 4	1
8	1000	Round to 1 s.f.: 500 × 20 ÷ 10 = 10 000 ÷ 10	1
9	£4000 *Also accept £5000 (from 250 × 20)*	248 ≈ 200 and £19.75 ≈ £20 200 × 20	1
10	£45 000	487 ≈ 500 and £2.93 ≈ £3 500 × 3 = 1500 a day 1500 × 30	1
11	£400	198 ≈ 200 and £1.89 ≈ £2 200 × 2	1
12	£1 200 000	28 950 ≈ 30 000 and £37.80 ≈ £40 30 000 × 40	1
13	15 000	492 ≈ 500 and 27 ≈ 30 500 × 30	1

Q	Answer	Working	Mark
14	400	19 860 ≈ 20 000 and 47 ≈ 50 20 000 ÷ 50	1
15	600 km/h	498 ≈ 500 km and 49 ≈ 50 minutes 500 ÷ 50 = 10 km per minute 10 × 60 minutes	1
16	80 km/h	397 ≈ 400 and 4.8 ≈ 5 400 ÷ 5	1
17	30 km/h	4980 m ≈ 5000 m = 5 km and 11 ≈ 10 minutes 5 km in 10 minutes = 5 × 6 km in 60 minutes	1
18	33.3... km/h *Also accept 30 km/h (from 300 ÷ 10)*	296 ≈ 300 and 9.1 ≈ 9 300 ÷ 9	1
19	750 km/h *Also accept other sensible estimates, e.g. 600 km/h*	1480 ≈ 1500 and 2.3 ≈ 2 1500 ÷ 2	1
20	6.7 *Also accept any answer from 6.5 to 6.9*	√36 = 6 and √49 = 7 45 is between 36 and 49, closer to 49	1
21	45 *Also accept any answer from 44 to 48*	√503 ≈ √500 ≈ 22.4 (between √484 = 22 and √529 = 23) 2.1 ≈ 2, so 22.4 × 2	1
22	£1400	187 ≈ 200 and £6.89 ≈ £7 200 × 7	1
23	4000 kg *Also accept 5000 kg (from 250 × 20)*	248 ≈ 200 and 19.7 ≈ 20 200 × 20	1
24	£60 000 *Also accept £40 000 (from 400 × 100)*	372 ≈ 400 and £147.50 ≈ £150 400 × 150	1
25	43 800 *Also accept any answer from 40 000 to 50 000 with working*	60 ÷ 12 = 5 buses an hour 5 × 24 = 120 buses a day 120 × 365 (or 120 × 400 = 48 000)	1

Q	Answer	Working	Mark
26	100	$9.95 \approx 10$ $10^2 = 10 \times 10$	1
27	25	$4.9 \approx 5$ $5^2 = 5 \times 5$	1
28	13.7 *Also accept any answer from 13 to 14*	$\sqrt{72}$ is between $\sqrt{64} = 8$ and $\sqrt{81} = 9$, about 8.5 $\sqrt{27}$ is between $\sqrt{25} = 5$ and $\sqrt{36} = 6$, about 5.2 $8.5 + 5.2$	1
29	72 cm^2 *Also accept 60 cm^2 (from 10×6)*	$12.32 \approx 12$ and $5.6 \approx 6$ Area = length × width = 12×6	1

Total available marks for this paper	**29**