YEAR 7 · MATHEMATICS · NUMBER AND ALGEBRA

WA CURRICULUM (SCSA) · UNDERSTANDING NUMBER

Equivalent Fractions — Marking Key

Equivalent fractions with related and unrelated denominators, visually and numerically.

WA7MNAUN1

SECTION A	SECTION B	SECTION C	SECTION D	SECTION E	TOTAL
18	28	19	22	13	100

How to use this key. The figure beside each question number is the total for that question; the right-hand column gives the marks for each part. Award **follow-through** marks where a later part is answered correctly using an earlier incorrect answer. Accept any equivalent correct form unless a note says otherwise. Notes marked ▸ give acceptable alternatives and the errors to watch for.

✓ Answers and mark allocation

Questions 1–25

100 MARKS

1 / 4

(a) Any three of $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, $\frac{6}{12}$ — **1**

▸ All three must come from the wall. Do not accept fractions not shown on it.

(b) $\frac{4}{6}$ and $\frac{8}{12}$ — **1**

(c) $\frac{3}{4}$ is larger — on the wall its bar reaches further; $\frac{3}{4} = \frac{6}{8}$ and 6 eighths > 5 eighths — **2**

▸ 1 mark for the correct fraction, 1 for a justification that refers to the wall or to eighths. A bare “it looks longer” earns the first mark only.

2 / 3

(a) A = $\frac{2}{5}$, B = $\frac{6}{15}$, C = $\frac{3}{10}$ — **1**

▸ The question says not to simplify, so B should be $\frac{6}{15}$. Accept $\frac{2}{5}$ without penalty — it is mathematically correct.

(b) A and B — **1**

(c) C is $\frac{3}{10}$; $\frac{2}{5} = \frac{4}{10}$, and 3 tenths ≠ 4 tenths — **1**

▸ Must convert to a common denominator or equivalent reasoning. “It has different numbers” earns nothing.

3 / 4

(a) 15 — **1**

(b) 6 — **1**

(c) 3 times smaller; 3 times greater; $\frac{2}{5} = \frac{6}{15}$ — **1**

▸ All three blanks needed for the mark.

(d) $\frac{3}{4} = \frac{15}{20}$; each quarter split into 5 — **1**

4 / 4

(a) $\frac{1}{4}$ at $\frac{3}{12}$, $\frac{1}{2}$ at $\frac{6}{12}$, $\frac{2}{3}$ at $\frac{8}{12}$, $\frac{5}{6}$ at $\frac{10}{12}$ — **2**

▸ 2 marks for all four placed and labelled; 1 mark for two or three.

(b) $\frac{3}{12}$, $\frac{6}{12}$, $\frac{8}{12}$, $\frac{10}{12}$ — **2**

▸ 2 marks for all four; 1 mark for two or three.

5 / 3

(—) Shade 3 of 4, 6 of 8, 9 of 12 — **2**

▸ 2 marks for all three; 1 mark for two.

(—) $\frac{3}{4} = \frac{6}{8} = \frac{9}{12}$ — **1**

▸ Follow-through from the shading.

6 / 6

(a) 12 — **1**

(b) 24 — **1**

(c) 10 — **1**

(d) 4 — **1**

(e) 35 — **1**

(f) 4 — **1**

7 / 5

(a) $\frac{3}{4}$ — **1**

▸ ÷6

(b) $\frac{5}{8}$ — **1**

▸ ÷7

(c) $\frac{2}{3}$ — **1**

▸ ÷21

(d) $\frac{7}{12}$ — **1**

▸ ÷12

(e) $\frac{3}{4}$ — **1**

▸ ÷17 — the hardest of the five; accept a two-step simplification.

8 / 2

(a) $\frac{4}{12}, \frac{5}{15}, \frac{6}{18}$ — **1**

▸ All three needed.

(b) $\frac{12}{16}, \frac{15}{20}, \frac{18}{24}$ — **1**

▸ All three needed.

9 / 3

(a) $\frac{8}{15}$ — **1**

▸ Should be $\frac{8}{12}$.

(b) $\frac{15}{48}$ — **1**

▸ Should be $\frac{15}{40}$.

(c) $\frac{25}{50}$ — **1**

▸ Should be $\frac{25}{60}$.

10 / 4

(a) $\frac{9}{12}$ and $\frac{10}{12}$ — **1**

(b) $\frac{14}{35}$ and $\frac{15}{35}$ — **1**

(c) $\frac{21}{30}$ and $\frac{22}{30}$ — **1**

(d) $\frac{15}{24}$ and $\frac{14}{24}$ — **1**

▸ Accept any common denominator, but the lowest is expected.

11 (4)

(a) 21 — **1**

▸ $\frac{6}{10} = \frac{3}{5}$, then ×7

(b) 15 — **1**

▸ $\frac{9}{12} = \frac{3}{4}$, then ×5

(c) 25 — **1**

▸ $\frac{20}{24} = \frac{5}{6}$, then ×5

(d) 8 — **1**

▸ $\frac{18}{27} = \frac{2}{3}$, then ×4

12 (4)

(a) True — both simplify to $\frac{3}{5}$ — **1**

▸ Verdict and reason both required for the mark.

(b) False — $\frac{40}{70}$ vs $\frac{42}{70}$ — **1**

(c) True — both simplify to $\frac{2}{3}$ — **1**

(d) False — $\frac{21}{35}$ vs $\frac{25}{35}$; adding 2 to both parts changes the value — **1**

13 (5)

(a) $>$ ($\frac{9}{12} > \frac{8}{12}$) — **1**

(b) $>$ ($\frac{15}{24} > \frac{14}{24}$) — **1**

(c) $>$ ($\frac{28}{63} > \frac{27}{63}$) — **1**

▸ Cross-multiplication is acceptable working.

(d) $=$ (both $\frac{3}{5}$) — **1**

(e) $<$ ($\frac{49}{70} < \frac{50}{70}$) — **1**

14 (3)

(—) Common denominator 48 (accept any common multiple of 3, 4, 8, 12 and 16) — **1**

▸ Award even if the ordering that follows is wrong.

(—) $\frac{7}{12}, \frac{5}{8}, \frac{2}{3}, \frac{11}{16}, \frac{3}{4}$ — **2**

▸ 2 marks for the full correct order; 1 mark if exactly two are transposed.

15 / 4

(a) $\frac{11}{12}$ — gaps are $\frac{3}{24}$ and $\frac{2}{24}$ **2**

▸ 1 mark for comparing the gaps over a common denominator, 1 for the answer.

(b) $\frac{7}{15}$ — gaps are $\frac{1}{22}$ and $\frac{1}{30}$ **2**

▸ 1 mark for both gaps, 1 for the answer. Decimals are acceptable working here.

16 / 4

(a) 7A = $\frac{3}{4}$, 7B = $\frac{3}{4}$ **1**

(b) Yes — both simplify to $\frac{3}{4}$ **1**

(c) Smaller. 7C = $\frac{3}{5}$; over 20ths, $\frac{15}{20}$ vs $\frac{12}{20}$ **2**

▸ 1 mark for simplifying to $\frac{3}{5}$, 1 for the comparison.

17 / 3

(a) Liam — $\frac{15}{18}$ vs $\frac{14}{18}$ **2**

▸ 1 mark for the common denominator, 1 for the answer.

(b) $\frac{1}{18}$ **1**

▸ Follow-through from (a).

18 / 4

(—) Blanks: 4, 4, 4, 12 **1**

▸ All four needed.

(—) Own justification for $\frac{2}{5} = \frac{6}{15}$: each fifth split into 3 equal parts, so each part is 3 times smaller; 3 times as many parts are needed to cover the same amount; so 2 fifths becomes 6 fifteenths **3**

▸ 1 mark for the splitting, 1 for the size of the parts, 1 for the conclusion. Accept a labelled diagram supporting the words, but not a diagram alone.

19 / 4

(a) $\frac{4}{7} < \frac{3}{4}$ ($\frac{16}{28}$ vs $\frac{21}{28}$), yet adding a positive fraction must increase the total **1**

▸ The point is that no calculation is needed. Accept any argument that the answer must exceed $\frac{3}{4}$.

(b) $\frac{9}{12} + \frac{4}{12} = \frac{13}{12} = 1\frac{1}{12}$ **2**

▸ 1 mark for the common denominator, 1 for the answer. Accept $\frac{13}{12}$ left as an improper fraction.

(c) He added numerators and denominators, which treats parts of different sizes as if they were the same **1**

20 / 4

(a) Yes — $\frac{9}{12} > \frac{8}{12}$ **2**

▸ 1 mark for the verdict, 1 for equivalent-fraction working.

(b) No. Counter-example: $\frac{2}{3}$ vs $\frac{3}{5}$ — 3 > 2 and 5 > 3, but $\frac{10}{15} > \frac{9}{15}$ **2**

▸ 1 mark for saying the reasoning fails, 1 for a valid counter-example. Many counter-examples exist — accept any that works.

21 / 4

(a) $\frac{6}{15}$ — equivalent **1**

(b) $\frac{5}{8}$ — not equivalent ($\frac{16}{40}$ vs $\frac{25}{40}$) **1**

(c) Multiplying splits every part into equal smaller parts and gives proportionally more of them, so the shaded amount is unchanged. Adding changes the number and the size of the parts inconsistently **2**

▸ 1 mark for the multiplying case, 1 for the adding case. Must refer to the size of the parts for the second mark.

22 / 6

(a) **Always** — multiply numerator and denominator by 2, 3, 4, … without end **2**

▸ 1 mark for the verdict, 1 for the justification, in each part of this question.

(b) **Always** (for positive fractions) — same number of parts, each smaller; e.g. $\frac{3}{8} < \frac{3}{5}$ **2**

(c) **Sometimes** — larger for a proper fraction ($\frac{2}{5} \to \frac{3}{6}$), smaller for an improper one ($\frac{5}{2} \to \frac{6}{3}$), unchanged when the parts are equal ($\frac{3}{3} \to \frac{4}{4}$) **2**

▸ For the second mark the student must show at least one case each way.

23 / 4

(a) n = 49 **1**

(b) m = 20 **1**

(c) k = 8 **1**

▸ From k + 2 = 10.

(d) x = 9 **1**

▸ $x^2 = 81$. The question restricts x to positive values, so −9 is excluded.

24 / 4

(a) 120 students **1**

▸ $\frac{3}{8} = 45$ so $\frac{1}{8} = 15$.

(b) 48 students **1**

▸ Follow-through from (a).

(c) $\frac{9}{40}$, which is 27 students **2**

▸ 1 mark for $\frac{9}{40}$ using a denominator of 40, 1 for 27 students. Check 45 + 48 + 27 = 120.

25 / 5

(a) Jug A = $\frac{2}{7}$, Jug B = $\frac{3}{10}$ — **1**

▸ Do not accept $\frac{2}{5}$ and $\frac{3}{7}$ — that compares cordial to water, not to the whole jug. This is the most common error on the page.

(b) Jug B — $\frac{20}{70}$ vs $\frac{21}{70}$ — **1**

▸ Follow-through from (a).

(c) $\frac{5}{17}$ — **1**

▸ 5 cups of cordial in 17 cups of mixture.

(d) $\frac{2}{7} = \frac{340}{1190}$, $\frac{5}{17} = \frac{350}{1190}$, $\frac{3}{10} = \frac{357}{1190}$; mixing a weaker and a stronger batch cannot land outside the two — **2**

▸ Accept a clear verbal argument without the common denominator for 1 mark. **Note for teachers:** part (c) is *not* $\frac{2}{7} + \frac{3}{10}$. Contrast with Q19 — adding fractions leaves the whole unchanged, whereas pouring two jugs together increases the whole, so both the cordial and the total combine.