

Exercise walk-through

1.2.1

Fractions

AQA · GCSE · Mathematics

19. Checklist before you call this topic done

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Four operations on fractions/mixed numbers and negatives without a calculator; BIDMAS traps. Prime decomposition $\rightarrow$ HCF/LCM; product rule for counting (H). Index laws including negative and fractional; simplify and rationalise surds (H). Standard form arithmetic; rounding and error intervals; upper/lower bounds through a formula (H). FDP conversions including recurring decimals (H); percentage multipliers and reverse percentages.

53. Signed numbers, place value and operation order · Foundation

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The balance is $-12+35-9=14$ yuan. Also $-4-(-7)=3$ and $(-6)\times(-3)=18$. The reciprocal of -4 is $-1/4$, since their product is 1. For $18\div3\times2$, work left to right to obtain 12. In 3.047, the 4 means four hundredths and the 7 means seven thousandths. For decimal multiplication, first calculate 24×35 : $24\times30+24\times5=720+120=840$. The original 2.4×0.35 has three decimal places in total, giving 0.840. For $5.04\div0.12$ multiply both numbers by 100 to get $504\div12$; $12\times40=480$ leaves 24, so the answer is 42. To order negative fractions, $-3/4=-0.75$ and $-4/5=-0.8$, hence $-4/5<-3/4$.

60. Exact fractions and mixed-number operations · Foundation

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$1\frac{1}{2} - \frac{3}{4} = \frac{6}{4} - \frac{3}{4} = \frac{3}{4}$. Also $(-\frac{2}{3}) \times (\frac{9}{4}) = -\frac{18}{12} = -\frac{3}{2}$ and $(\frac{3}{4}) \div (\frac{5}{8}) = (\frac{3}{4}) \times (\frac{8}{5}) = \frac{6}{5}$. A common denominator gives $\frac{5}{6} + \frac{3}{4} = \frac{10}{12} + \frac{9}{12} = \frac{19}{12}$. Check division by multiplying $\frac{6}{5}$ by $\frac{5}{8}$ to recover $\frac{3}{4}$. Exact multiples of π follow ordinary arithmetic: $3\pi + 2\pi = 5\pi$ and $6\pi/3 = 2\pi$. Leave an answer such as 5π exact when requested; $\pi \approx 3.14$ would introduce approximation. For subtraction, $\frac{5}{6} - \frac{3}{4} = \frac{10}{12} - \frac{9}{12} = \frac{1}{12}$; for a negative mixed number, $-1\frac{1}{2}$ means $-(1 + \frac{1}{2}) = -\frac{3}{2}$.

Exercises 2.1·2.3

2.1 (Foundation) Find $1\frac{1}{2}-\frac{3}{4}$.

2.2 (Foundation) Find $(-\frac{2}{3})\times(\frac{9}{4})$.

2.3 (Foundation) Find $(\frac{3}{4})\div(\frac{5}{8})$.

3 Exam-style questions

Exercises 2.1·2.3

2.1 (Foundation) Find $1\frac{1}{2}-\frac{3}{4}$.

2.1 $6/4-3/4=3/4=0.75$.

2.2 (Foundation) Find $(-2/3)\times(9/4)$.

2.2 $(-2\times 9)/(3\times 4)=-18/12=-1.5$.

2.3 (Foundation) Find $(3/4)\div(5/8)$.

3 Exam-style questions

2.3 Multiply by $8/5$: $24/20=6/5=1.2$.

Exercise 3.1

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: To add two fractions, add their numerators and add their denominators.

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3.1 False. $1/2 + 1/2 = 1$, while $(1+1)/(2+2) = 1/2$. Use a common denominator and add the adjusted numerators.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.