Number & Algebra Assessment

ACMNA183 –Rational Numbers (Answers)

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Name: _____

Score: _____

Teacher: _____

Assessment | Navigator | Student | 30 min

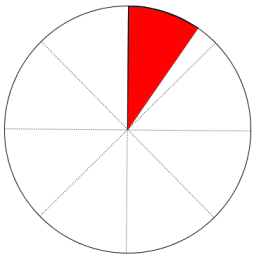
Comments: Questions in this test have purposely been written to avoid exact calculations in favour of estimation and reasoning. Follow up discussion of how students arrived at their answers will help establish their level of understanding. Individual comments on questions have been included as appropriate.

Q.1. The fraction shaded is closest to:

a) $\frac{1}{9}$ b) $\frac{1}{7}$

c) $\frac{1}{4}$ d) $\frac{1}{3}$

e) $\frac{2}{5}$



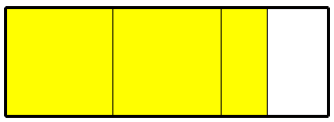
Q1. Comments: Options (c), (d) & (e) are all too big. Option (a) and (b) are either side of the recognisable 1/8. Students that choose 1/7 have reasoned incorrectly how the denominator effects the size of the fraction.

Q.2. The fraction shaded is closest to:

a) $\frac{1}{3}$ b) $\frac{5}{6}$

c) $\frac{11}{12}$ d) $2\frac{1}{2}$

e) $\frac{11}{18}$



Q2. Comments: Option (a) is too small, (e) is less than 2/3 and therefore too small. Option (d) is for students that see the divisions as 'whole' rather than parts of the whole. The shaded area is almost half way through the third section therefore close to 5/6. Pption(c) is more than 5/6, so option (b) is correct.

Q.3. Which one of the following values would be a useful common denominator for the sum:

$$\frac{1}{4}+\frac{1}{6}$$

a) 2 b) 4 c) 6 d) 10 e) 12

Q.4. Which one of the following is equal to: $\frac{3}{4}$

a) $\frac{1}{2}+\frac{1}{3}$ b) $\frac{1}{2}+\frac{2}{3}$ c) $\frac{1}{3}+\frac{1}{4}$ d) $\frac{1}{12}+\frac{2}{3}$ e) $\frac{1}{5}+\frac{2}{7}$

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Q.5. Which fraction is closest to: $\frac{302}{407}$

a) $\frac{1}{4}$ b) $\frac{1}{2}$ c) $\frac{3}{4}$ d) $\frac{4}{5}$ e) 1

Q5. Comments: The numerator is very close to 300 and the denominator very close to 400 so the fraction is close to 3/4.

Q.6. Which fraction is closest to: $\frac{99}{201}+\frac{101}{400}$

a) $\frac{1}{4}$ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) $\frac{3}{4}$ e) 1

Q6. Comments: It is NOT intended for students to determine the actual answer. The first fraction is very close to 1/2 and the second to 1/4 so the answer is a fraction close to 3/4.

Q.7. Which one of the following calculations will produce the **smallest** answer:

a) $\frac{1}{2}+\frac{1}{6}$ b) $\frac{1}{2}\times\frac{1}{6}$ c) $\frac{1}{2}\div\frac{1}{6}$ d) $\frac{1}{2}-\frac{1}{6}$ e) $\frac{1}{6}\div\frac{1}{2}$

Q7. Comments: Intended to challenge concept of 'multiplying by a number less than 1'. Option (a) must be greater than ½ Options (c) and (e) involve division by a number less than 1, therefore resulting in a larger number leaving students to compare option (b) and (d) with reasoning also able to eliminate (d).

Q.8. Which calculation will result in the **largest** value?

a) $\frac{1}{2}\div\frac{1}{4}$ b) $\frac{1}{2}\div\frac{1}{5}$ c) $\frac{1}{2}\div\frac{2}{3}$ d) $\frac{1}{2}\div\frac{3}{5}$ e) $\frac{1}{2}\div 2$

Q8. Comments: Dividing by a smaller number increases the size of the result.

Q.9. $4\frac{1}{13}\times 5\frac{1}{11}$ will be closest to which one of the following?

a) 4 b) 5 c) 9 d) 21 e) 24

Q9. Comments: Students should consider that 1/13 and 1/11 are quite small, therefore a rough estimate of the result is 4 x 5. The fraction component of each number is less than '10%' so a more accurate estimate would include 10% of 4 and 10% of 5 improving the estimate to 20.9.

Q.10. $4\frac{1}{3}\div 2\frac{1}{7}$ will be closest to which one of the following?

a) $\frac{2}{9}$ b) 2 c) 4 d) $4\frac{1}{3}$ e) $9\frac{7}{18}$

Q10. Comments: 4 and 1/3 is very close to double 2 and 1/7, therefore the division would result in an answer close to 2..

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