RECURRING DECIMALS TO FRACTIONS

GRADE 6

AtoZrevision

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

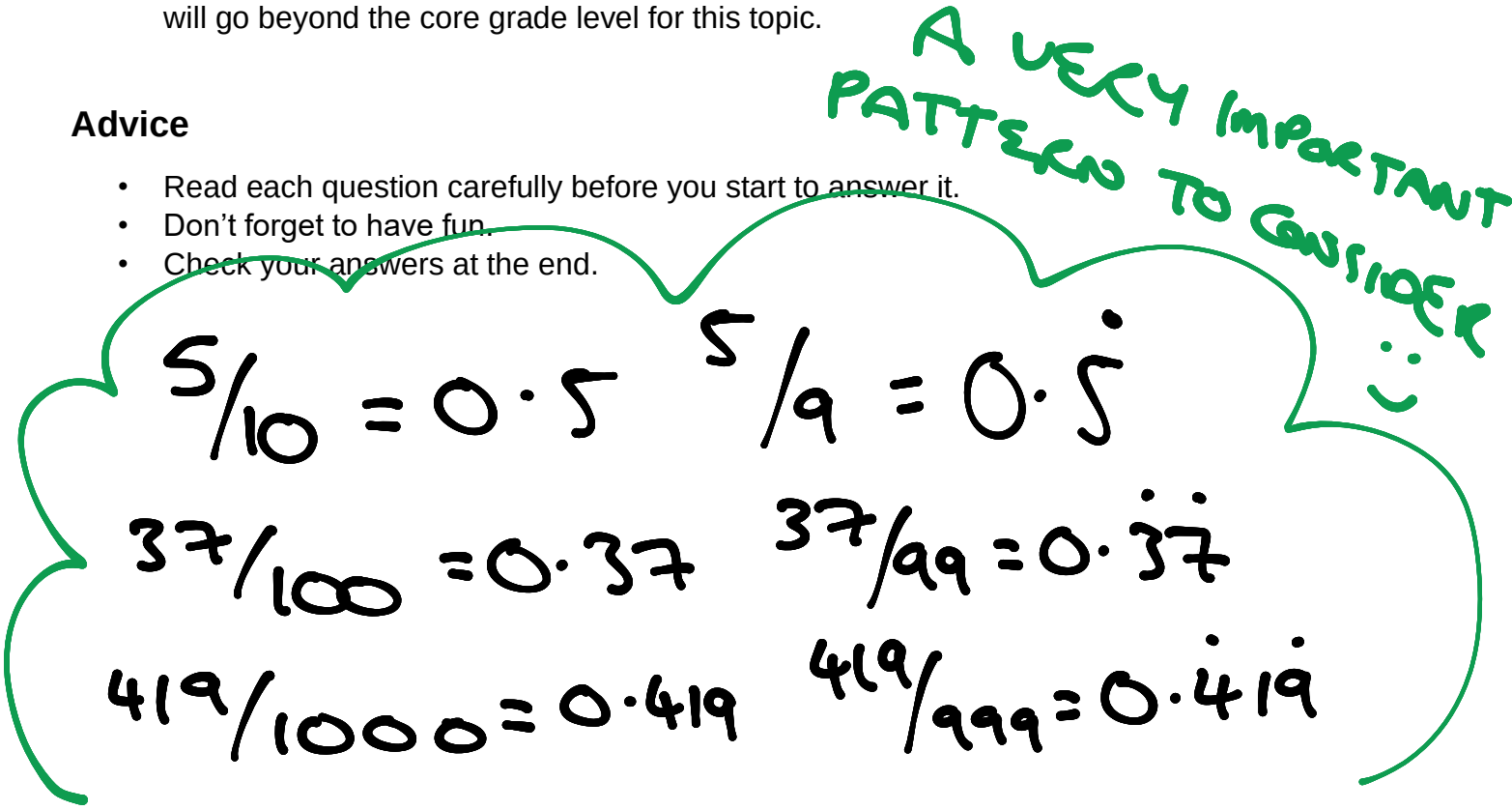
- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.



Q1. AtoZrevision.com

Write $\frac{7}{9}$ as a recurring decimal.

$0.\dot{7}$

(1 mark)

Q2. AtoZrevision.com

Write $\frac{17}{99}$ as a recurring decimal.

$0.\dot{1}\dot{7}$

(1 mark)

Q3. AtoZrevision.com

Write $\frac{712}{999}$ as a recurring decimal.

$0.\dot{7}1\dot{2}$

(1 mark)

Q4. AtoZrevision.com

Express $\frac{1}{6}$ as a decimal.

$$6\overline{)1.0000} = 0.1666\ldots$$

$0.1\dot{6}$

(1 mark)

Q5. AtoZrevision.com

Select the fraction which is a recurring decimal.

$\frac{21}{35}$ $\frac{10}{12}$ $\frac{17}{68}$ $\frac{15}{24}$ $\frac{51}{170}$

$10/12 = 5/6$

$10/12$

(1 mark)

$\frac{x}{6}$ (AS ABOVE) IS RECURRING.

Q6. AtoZrevision.com

Write these numbers in order of size.
Start with the smallest number.

$0.2\dot{4}\dot{6}$ $0.24\dot{6}$ $0.\dot{2}4\dot{6}$ 0.246

0·246464
0·246666
0·246246
0·246000

0·246
0·$\dot{2}$46
0·246$\dot{}$
0·246$\dot{}$

SMALL
LARGE

M1 FOR 3 CORRECT

A1

(2 marks)

Q7. AtoZrevision.com

Prove algebraically that the recurring decimal $0.\dot{5}$ can be written as $\frac{5}{9}$

$10x = 5.555..$
$-\quad x = 0.555..$
$9x = 5$
$x = 5/9$

M1 FOR THE START OF A METHOD TO CONVERT

A1 FULLY CORRECT PROOF

(2 marks)

Q8. AtoZrevision.com

Prove algebraically that the recurring decimal $0.\dot{1}\dot{5}$ can be written as $\frac{15}{99}$

$100x = 15.1515..$
$-\quad x = 0.1515..$
$99x = 15$
$x = \frac{15}{99}$

SEE Q7

(2 marks)

Q9. AtoZrevision.com

Show that the recurring decimal $0.\dot{3}9\dot{6}$ can be written as $\frac{44}{111}$

$$1000x = 396.396..$$
$$-\quad x = 0.396..$$
$$999x = 396$$
$$x = \frac{396}{999} = \frac{44}{111}$$

See Q7

(2 marks)

Q10. AtoZrevision.com

Use algebra to show that the recurring decimal $0.\dot{4}1\dot{7} = \frac{139}{333}$

$$1000x = 417.417..$$
$$x = 0.417..$$
$$999x = 417$$
$$x = \frac{417}{999} = \frac{139}{333}$$

See Q7

(2 marks)

Q11. AtoZrevision.com

Use algebra to show that the recurring decimal $0.2\dot{6}$ can be written as $\frac{4}{15}$

$$10x = 2.666..$$
$$-\quad x = 0.266..$$
$$9x = 2.4$$
$$x = \frac{2.4}{9} = \frac{24}{90} = \frac{4}{15}$$

See Q7

(2 marks)

Q12. AtoZrevision.com

Use algebra to show that the recurring decimal $0.3\dot{8} = \frac{7}{18}$

$10x = 3.888..$

$x = 0.388..$

$9x = 3.5$

$x = \frac{3.5}{9} = \frac{35}{90} = \frac{7}{18}$

SEE Q7

(2 marks)

Q13. AtoZrevision.com

Use algebra to show that the recurring decimal $0.0\dot{1}\dot{5}$ can be written as $\frac{1}{66}$

$100x = 1.5151515..$

$x = 0.01515..$

$99x = 1.5$

$x = \frac{1.5}{99} = \frac{15}{990} = \frac{1}{66}$

SEE Q7

(2 marks)

Q14. AtoZrevision.com

Use algebra to show that the recurring decimal $0.3\dot{2}\dot{4} = \frac{107}{330}$

$1000x = 324.2424..$

$10x = 3.2424..$

$990x = 321$

$x = \frac{321}{990} = \frac{107}{330}$

THE AIM IS TO ALIGN THE RECURRING BIT ☺

SEE Q7

(2 marks)

Q15. AtoZrevision.com

Use algebra to show that the recurring decimal $0.2\dot{5}\dot{4}$ can be written as $\frac{14}{55}$

$1000x = 254.5454..$

$-\quad 10x = 2.5454..$

$990x = 252$

$x = \frac{252}{990} = \frac{14}{55}$

See Q7

(2 marks)

Q16. AtoZrevision.com

Use algebra to show that the recurring decimal $0.0\dot{1}\dot{5}$ can be written as $\frac{154}{990}$

$100x = 1.555..$

$-\quad x = 0.015...$

$99x = 1.54$

$x = \frac{1.54}{99} = \frac{154}{990}$

See Q7

(2 marks)

Q17. AtoZrevision.com

Use algebra to show that the recurring decimal $0.28\dot{1}\dot{3} = \frac{557}{1980}$

$1000x = 281.31313..$

$-\quad 10x = 2.81313..$

$990x = 278.5$

$x = \frac{278.5}{990} = \frac{2785}{9900}$

$= 557/1980$

See Q7

(2 marks)

Q18. AtoZrevision.com

$0.4\dot{x}$ is a recurring decimal.
x is a whole number such that $1 \leq x \leq 9$

Find, in terms of x, the recurring decimal $0.4\dot{x}$ as a fraction.
Give your fraction in its simplest form.
Show clear algebraic working.

$\frac{x}{10}$ AS THESE ARE UNITS

$10y = 4x.xx\ldots$
$y = 0.4x\ldots$
$9y = 4\frac{x}{10} - 0.4$
$9y = \frac{40+x-4}{10}$
$90y = 40 + x - 4$
$\therefore y = \frac{36+x}{90}$ A1

$4\frac{x}{10} - 0.4$
$4\frac{x}{10} - \frac{4}{10}$
$\frac{40+x}{10} - \frac{4}{10}$
$\frac{40+x-4}{10}$ M1

M1

(3 marks)

Q19. AtoZrevision.com

PHEW!

Using algebra, prove that $0.1\dot{3}\dot{6} \times 0.\dot{2}$ is equal in value to $\frac{1}{33}$

$100x = 13.636..$
$x = 0.136..$
$99x = 13.5$ M1
$x = \frac{135}{990} = \frac{27}{198}$

$0.\dot{2} = \frac{2}{9}$ M1

$\frac{27}{198} \times \frac{2}{9} = \frac{54}{1782} = \frac{1}{33}$ A1

(3 marks)

QUESTIONS FROM MATHEMATICAL COMPETITIONS

Q1. AtoZrevision.com

As a decimal, what is the value of $\frac{1}{9}+\frac{1}{11}$

$\frac{1}{9}+\frac{1}{11}=\frac{11}{99}+\frac{9}{99}=\frac{20}{99}$

SEE 1ST PAGE ↑

$20/99 = 0.202020$

$= 0.\dot{2}0$

Q2. AtoZrevision.com

As a decimal, what is the value of $\frac{10}{9}+\frac{9}{10}$

$\frac{100}{90}+\frac{81}{90}=\frac{181}{90}=2+\frac{1}{90}$

0.01

$\therefore 2.0\dot{1}$

Q3. AtoZrevision.com

How many different digits appear when $\frac{20}{11}$ is written as a recurring decimal? Circle the answer.

2 3 4 5 6

$\frac{20}{11}=1\frac{9}{11}=1.\dot{8}\dot{1}$

(1 AND 8)

$81/99 = 0.\dot{8}\dot{1}$

Q4. AtoZrevision.com

What is the sum of the first 2011 digits when $20 \div 11$ is written as a decimal?

AS ABOVE: $1.818181\ldots$

1006 1's THE EXTRA 1

1005 8's

$(1006 \times 1) + (1005 \times 8) = 9046$

Q5. AtoZrevision.com

Which of these is equal to $0.\dot{8} + 0.0\dot{7}$?

$0.\dot{8} = \frac{8}{9}$

$0.0\dot{7} = \frac{7}{90}$

$\frac{8}{9} + \frac{7}{90} = \frac{29}{30}$

TRICKY BIT:

$\frac{29}{3} = 9 + \frac{2}{3}$

$= 9 + 0.\dot{6}$

$= 9.\dot{6}$

SEE 1ST PAGE ↑

SO $29/30 = 0.9\dot{6}$

$0.8\dot{7}$

0.88

$0.9\dot{5}$

$0.9\dot{6}$

$0.9\dot{8}$

Q6. AtoZrevision.com

What is the mean of $1.\dot{2}$ and $2.\dot{1}$?

$1.2222\ldots$

$2.1111\ldots$

3.3333

OR $3.\dot{3}$

$\frac{3.\dot{3}}{2} = 1.\dot{6}$

$1.\dot{6}$

1.666

1.665

$1.6\dot{5}$

1.65