13 (a) Use algebra to show that $0.5\dot{7}\dot{2} = \frac{63}{110}$

$0.5\dot{7}\dot{2} = x$

$0.5727272 = x$

$5.7272727 = 10x$

$572.7272727 = 1000x$

$1000x - 10x$

$567 = 990x$ (2)

$\frac{567}{990} = x$

$\frac{63}{110} = x$

15 (a) Use algebra to show that $4.\dot{5}\dot{7} = 4\frac{19}{33}$

$4.\dot{5}\dot{7} = x$

$4.575757 = x$

$457.575757 = 100x$

$100x - x$

$453 = 99x$

$\frac{453}{99} = x$

$\frac{151}{33} = x$

$4\frac{19}{33} = x$

(2)

13 Use algebra to show that $0.3\dot{8}\dot{1} = \frac{21}{55}$

$0.3\dot{8}\dot{1} = x$

$0.381818181 = x$

$3.818181 = 10x$

$381.818181 = 1000x$

$1000x - 10x$

$378 = 990x$

$\frac{378}{990} = x$

$\frac{21}{55} = x$

(Total for Question 13 is 2 marks)

16 Use algebra to show that $0.4\dot{3}\dot{8} = \frac{217}{495}$

$0.4\dot{3}\dot{8} = x$

$0.4383838 = x$

$4.3838 = 10x$

$438.383838 = 1000x$

$1000x - 10x$

$434 = 990x$

$\frac{434}{990} = x$

$\frac{217}{495} = x$

(Total for Question 16 is 2 marks)

17 (a) Use algebra to show that $0.4\dot{3}\dot{6} = \frac{24}{55}$

$0.4\dot{3}\dot{6} = x$

$0.4363636 = x$

$4.363636 = 10x$

$436.363636 = 1000x$

$1000x - 10x$

$432 = 990x$

$\frac{432}{990} = x$

$\frac{24}{55} = x$

(2)

15 Use algebra to show that the recurring decimal $0.2\dot{5}\dot{4} = \frac{14}{55}$

$0.2\dot{5}\dot{4} = x$

$0.254545\ldots = x$

$2.545454\ldots = 10x$

$254.545454\ldots = 1000x$

$1000x - 10x$

$252 = 990x$

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

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

(Total for Question 15 is 2 marks)

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

$0.28\dot{1}\dot{3} = x$

$0.28131313 = x$

$28.131313 = 100x$

$2813.131313 = 10000x$

$10000x - 100x$

$2785 = 9900x$

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

(Total for Question 16 is 2 marks)

$\frac{557}{1980} = x$

17 Use algebra to show that $0.\dot{3}\dot{4}\dot{5} = \frac{19}{55}$

$0.\dot{3}\dot{4}\dot{5} = x$

$0.3454545 = x$

$3.454545 = 10x$

$345.454545 = 1000x$

$1000x - 10x$

$342 = 990x$

$\frac{342}{990} = x$

$\frac{19}{55} = x$

(Total for Question 17 is 2 marks)

16 Use algebra to show that $0.1\dot{7}\dot{6} = \frac{35}{198}$

$0.1\dot{7}\dot{6} = x$

$0.176767676 = x$

$1.767676 = 10x$

$176.767676 = 1000x$

$1000x - 10x$

$175 = 990x$

$\frac{175}{990} = x$

(Total for Question 16 is 2 marks)

$\frac{35}{198} = x$

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

18 Use algebra to show that $0.\dot{3}0\dot{6} = \frac{34}{111}$

$0.\dot{3}0\dot{6} = x$

$0.306\,306\,306 = x$

$306.306\,306 = 1000x$

$306306.306\,306 = 1000000x$

$1000000 - 1000x$

$306000 = 999000x$

$\frac{306000}{999000} = x$

$\frac{34}{111} = x$

(Total for Question 18 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

15 (a) Use algebra to show that $0.3\dot{7}\dot{2} = \frac{41}{110}$

$0.3\dot{7}\dot{2} = x$

$0.372727272 = x$

$3.727272 = 10x$

$372.727272 = 1000x$

$1000x - 10x$

$369 = 990x$

$\frac{369}{990} = x$

$\frac{41}{110} = x$

(2)

15 Use algebra to show that $0.7\dot{6}\dot{3} = \frac{42}{55}$

$0.\dot{7}6\dot{3} = x$

$0.7636363 = x$

$7.636363 = 10x$

$763.636363 = 1000x$

$1000x - 10x$

$756 = 990x$

$\frac{756}{990} = x$

$\frac{42}{55} = x$

(Total for Question 15 is 2 marks)

13 Use algebra to show that $0.68\dot{1}\dot{1} = \frac{15}{22}$

$0.68\dot{1}\dot{1} = x$

$0.6818181 = x$

$6.8181\,81 = 10x$

$681.8181\,81 = 1000x$

$1000x - 10x$

$675 = 990x$

$\frac{675}{990} = x$

$\frac{15}{22} = x$

(Total for Question 13 is 2 marks)

18 $0.4\dot{x}$ is a recurring decimal.
x is a whole number such that $1 \leqslant x \leqslant 9$

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.

$0.4\dot{x} = y$

$0.4xxxx = y$

$4.xxxx = 10y$

$4x.xxxx = 100y$

$40+x.xxxx = 100y$

$100y - 10y$

$40+x-4 = 90y$

$36+x = 90y$

$\frac{36+x}{90} = y$

(Total for Question 18 is 3 marks)