

Name: _____

GCSE Unit 17 Practice Assessment

Date: _____

Time: 60 minutes

Total marks available: 51

Total marks achieved: _____

Questions

Q1.

Rationalise the denominator $\frac{3}{\sqrt{7}}$

.....
(Total for Question is 2 marks)

Q2.

Simplify $\frac{x+1}{2} + \frac{x+3}{3}$

.....
(Total for Question is 3 marks)

Q3.

Simplify fully $\frac{4}{2-x} - \frac{3}{x}$

.....
(Total for question = 3 marks)

Q4.

$$m = \sqrt{\frac{k^3 + 1}{4}}$$

Make k the subject of the formula.

.....
(Total for question is 3 marks)

Q5.

Write $\frac{3}{b} + \frac{2}{a-b}$ as a single fraction in its simplest form.

(Total for Question is 3 marks)

Q6.

Simplify fully $\frac{3x^2 - 6x}{x^2 + 2x - 8}$

.....

(Total for Question is 3 marks)

Q7.

Write $(5 - \sqrt{5})^2$ in the form $a + b\sqrt{5}$, where a and b are integers.

.....

(Total for Question is 2 marks)

Q8.

$$\frac{(6 - \sqrt{5})(6 + \sqrt{5})}{\sqrt{31}}$$

Rationalise the denominator of

Give your answer in its simplest form.

(Total for Question is 3 marks)

Q9.

$$\frac{1}{1 + \frac{1}{\sqrt{2}}}$$

Show that $\frac{1}{1 + \frac{1}{\sqrt{2}}}$ can be written as $2 - \sqrt{2}$

(Total for question = 3 marks)

Q10.

(a) Rationalise the denominator of $\frac{5}{\sqrt{2}}$

.....
(2)

(b) Expand and simplify $(2 + \sqrt{3})^2 - (2 - \sqrt{3})^2$

.....
(2)

(Total for Question is 4 marks)

Q11.

* Prove algebraically that the difference between the squares of any two consecutive integers is equal to the sum of these two integers.

(Total for Question is 4 marks)

Q12.

Prove that

$(2n + 3)^2 - (2n - 3)^2$ is a multiple of 8

for all positive integer values of n .

(Total for Question is 3 marks)

Q13.

Show that $\frac{3x + 6}{x^2 - 3x - 10} \div \frac{x + 5}{x^3 - 25x}$ simplifies to ax where a is an integer.

(Total for question = 4 marks)

Q14.

Solve $\frac{x+2}{3x} + \frac{x-2}{2x} = 3$

$x = \dots\dots\dots$

(Total for question is 3 marks)

Q15.

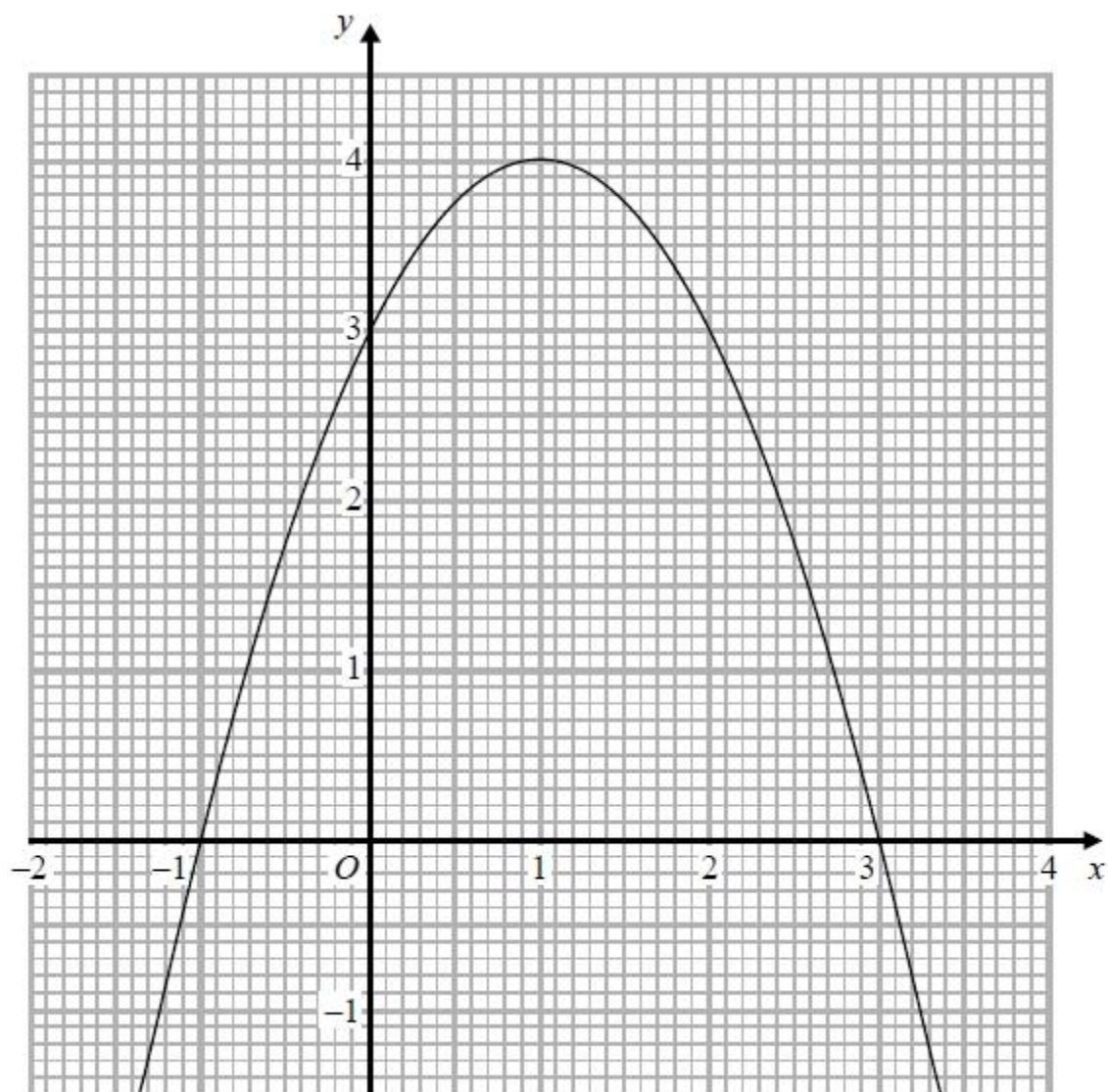
Solve $\frac{4x-1}{5} + \frac{x+4}{2} = 3$

$x = \dots\dots\dots$

(Total for Question is 3 marks)

Q16.

The graph of $y = f(x)$ is drawn on the grid.



(a) Write down the coordinates of the turning point of the graph.

(.....,)

(1)

(b) Write down the roots of $f(x) = 2$

.....

(1)

(c) Write down the value of $f(0.5)$

.....

(1)

(Total for question = 3 marks)

Q17.

The function f is such that

$$f(x) = 4x - 1$$

(a) Find $f^{-1}(x)$

$$f^{-1}(x) = \dots\dots\dots$$

(2)

The function g is such that

$$g(x) = kx^2 \text{ where } k \text{ is a constant.}$$

Given that $fg(2) = 12$

(b) work out the value of k

$$k = \dots\dots\dots$$

(2)

(Total for question = 4 marks)