Maths questions for first lesson in September

Please complete on lined paper.
Show all working out.
Good luck!

SECTION A QUADRATICS

Solve the following simultaneous equations

g $2x^2 + xy + y^2 = 22$ $x + y = 4$	**h** $x^2 - 4y - y^2 = 0$ $x - 2y = 0$	**i** $x^2 + xy = 4$ $3x + 2y = 6$

Make sure to show all working out. We will go over these in your first lesson with me in September

SECTION B 5 INDICES QUESTIONS

1.

(a) Write down the value of $125^{\frac{1}{3}}$.

(b) Find the value of $125^{-\frac{2}{3}}$.

2.

(a) Write down the value of $16^{\frac{1}{4}}$.

(b) Simplify $(16x^{12})^{\frac{3}{4}}$.

3.

(a) Find the value of $8^{\frac{4}{3}}$.

(b) Simplify $\frac{15x^{\frac{4}{3}}}{3x}$.

4.

Given that $\dfrac{2x^2 - x\frac{3}{2}}{\sqrt{x}}$ can be written in the form $2x^p - x^q$,

(a) write down the value of p and the value of q.

5.

(a) Given that $3^x = 9^{y-1}$, show that $x = 2y - 2$.

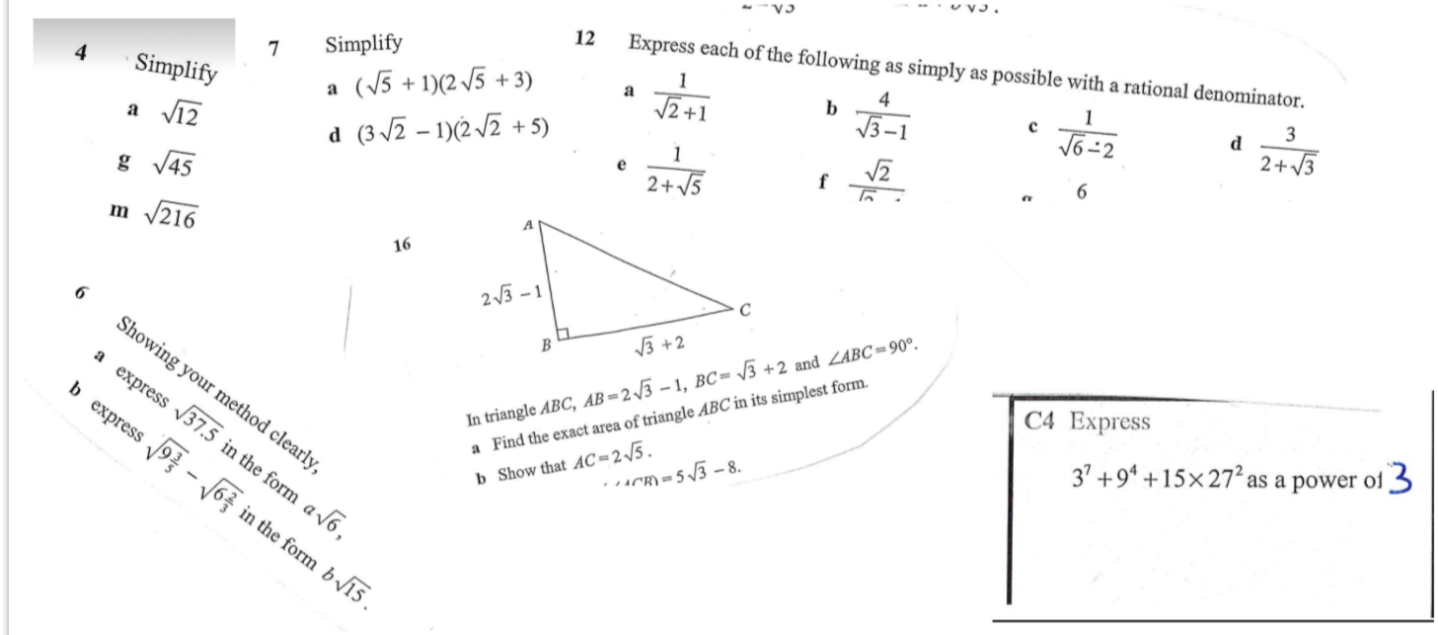
(b) Solve the simultaneous equations

$$x = 2y - 2,$$

$$x^2 = y^2 + 7.$$

SECTION C SURDS

4m, 7a, 12d, 6a, 16a, c4



4 Simplify
a $\sqrt{12}$
g $\sqrt{45}$
m $\sqrt{216}$

7 Simplify
a $(\sqrt{5}+1)(2\sqrt{5}+3)$
d $(3\sqrt{2}-1)(2\sqrt{2}+5)$

12 Express each of the following as simply as possible with a rational denominator.
a $\frac{1}{\sqrt{2}+1}$ b $\frac{4}{\sqrt{3}-1}$ c $\frac{1}{\sqrt{6}-2}$ d $\frac{3}{2+\sqrt{3}}$
e $\frac{1}{2+\sqrt{5}}$ f $\frac{\sqrt{2}}{\sqrt{2}}$

6
Showing your method clearly,
a express $\sqrt{37.5}$ in the form $a\sqrt{6}$,
b express $\sqrt{9\frac{3}{5}} - \sqrt{6\frac{2}{3}}$ in the form $b\sqrt{15}$.

16

In triangle ABC, $AB = 2\sqrt{3} - 1$, $BC = \sqrt{3} + 2$ and $\angle ABC = 90°$.
a Find the exact area of triangle ABC in its simplest form.
b Show that $AC = 2\sqrt{5}$.
$(AC^2) = 5\sqrt{3} - 8$.

C4 Express
$3^7 + 9^4 + 15 \times 27^2$ as a power of 3

We look forward to seeing you all soon!