**6** $x$

$x$

$x$

**(1)**

$y$

$y$

$y$

**(1)**

$a$ $b$ $w$

$w$ $a$ $b$

**(2)**

**(Total for Question 6 is 4 marks)**

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**18** $16^{\frac{1}{5}} \times 2^x = 8^{\frac{3}{4}}$

Work out the exact value of $x$.

BO18A

.....

**(Total for Question 18 is 3 marks)**

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PF9A

**9** (a) Express $\sqrt{\dfrac{10^{360}}{10^{150} \times 10^{90}}}$ as a power of 10

.....

**(3)**

Liam was asked to express $(12^{50})^2$ as a power of 12

Liam wrote $(12^{50})^2 = 12^{50^2} = 12^{2500}$

Liam's method is wrong.

(b) Explain why.

.....

.....

.....

**(1)**

**(Total for Question 9 is 4 marks)**

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**11** In May 2019, the distance between Earth and Mars was $3.9 \times 10^7$ km.

In May 2019, a signal was sent from Earth to Mars.
Assuming that the signal sent from Earth to Mars travelled at a speed of $3 \times 10^5$ km per second,

(a) how long did the signal take to get to Mars?

KZ11A

..... seconds

**(2)**

The speed of the signal sent from Earth to Mars in May 2019 was actually less than $3 \times 10^5$ km per second.

(b) How will this affect your answer to part (a)?

.....

.....

.....

**(1)**

**(Total for Question 11 is 3 marks)**

**12** Patrick has to work out the exact value of $64^{\frac{1}{4}}$

KZ12A

Patrick says,

"$\frac{1}{4}$ of 64 is 16 so $64^{\frac{1}{4}} = 16$"

Explain what is wrong with what Patrick says.

.....

.....

.....

**(Total for Question 12 is 1 mark)**

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PD18A

**18** Work out the value of $\dfrac{\left(5\frac{4}{9}\right)^{-\frac{1}{2}} \times \left(4\frac{2}{3}\right)}{2^{-3}}$

You must show all your working.

.....

**(Total for Question 18 is 4 marks)**

**11** Write $\dfrac{(6x^5y^3)^2}{3x^2y^7 \times 4xy^{-3}}$ in the form $ax^by^c$ where $a$, $b$ and $c$ are integers.

PK11A

.....

**(Total for Question 11 is 3 marks)**

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**8** (a) Work out an estimate for the value of $\sqrt{63.5 \times 101.7}$

KX8A

.....

**(2)**

$(2.3)^6 = 148$ correct to 3 significant figures.

(b) Find the value of $(0.23)^6$ correct to 3 significant figures.

.....

**(1)**

(c) Find the value of $5^{-2}$

.....

**(1)**

**(Total for Question 8 is 4 marks)**

**10** (a) Write down the value of $100^{\frac{1}{2}}$

BK10A

.....

**(1)**

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

.....

**(2)**

**(Total for Question 10 is 3 marks)**

**11** 3 teas and 2 coffees have a total cost of £7.80
5 teas and 4 coffees have a total cost of £14.20

Work out the cost of one tea and the cost of one coffee.

BK11A

tea £.....

coffee £.....

**(Total for Question 11 is 4 marks)**

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**3** Simplify $(2^{-5} \times 2^{8})^{2}$

Give your answer as a power of 2

PG3A

.....

**(Total for Question 3 is 2 marks)**

**4** Work out $0.004 \times 0.32$

PG4A

.....

**(Total for Question 4 is 2 marks)**

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**17** Work out the value of $\left(\frac{8}{27}\right)^{\frac{4}{3}}$

PG17A

.....

**(Total for Question 17 is 2 marks)**

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**2** (a) (i) Write down the value of $5^0$

PN2A

.....

**(1)**

(ii) Write down the value of $5^{-2}$

.....

**(1)**

(b) Write $\dfrac{2^5 \times 2^4}{2^3}$ in the form $2^n$ where $n$ is an integer.

.....

**(2)**

**(Total for Question 2 is 4 marks)**

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**14** Work out the value of $27^{\frac{2}{3}} + \left(\frac{1}{2}\right)^{-3}$

PN14A

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**(Total for Question 14 is 3 marks)**

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BH9A

**9** (a) Write down the value of $36^{\frac{1}{2}}$

.....

**(1)**

(b) Write down the value of $23^0$

.....

**(1)**

(c) Work out the value of $27^{-\frac{2}{3}}$

.....

**(2)**

**(Total for Question 9 is 4 marks)**

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**14** (a) Work out the value of $\left(\frac{16}{81}\right)^{\frac{3}{4}}$

AP14A

.....

**(2)**

$3^a = \frac{1}{9}$ $3^b = 9\sqrt{3}$ $3^c = \frac{1}{\sqrt{3}}$

(b) Work out the value of $a + b + c$

.....

**(2)**

**(Total for Question 14 is 4 marks)**