23. Given that $d = \sqrt{5}$, $e = \sqrt{2}$ and $f = \sqrt{20}$, simplify **each** of the following, indicating in each case whether your answer is rational or irrational.

(a) $3d^2$

....

....

....

....

....

[1]

(b) $\dfrac{f}{de}$

....

....

....

....

....

[2]

24. Express $\sqrt{243}$ in the form $a\sqrt{b}$, where a is a whole number and b is a prime number.

....

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....

....

[2]

17. *(a)* Express $0 \cdot 3\overset{\cdot\cdot}{4}27$ as a fraction.

....

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....

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....

....

[2]

(b) Write down a value of x for which $x^{\frac{3}{2}}$ is rational.

....

....

....

[1]

(c) Give an example of an irrational number

    (i)   whose square is rational,

....

....

[1]

    (ii)   whose square is irrational.

....

....

[1]

(d) Find the value of $(\sqrt{32}+\sqrt{2})^2$.

....

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....

[2]

18. *(a)* Express $0.6\overset{..}{24}$ as a fraction.

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[2]

(b) Show that $\left(\sqrt{72}-\sqrt{2}\right)^2 = 50.$

....

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[2]

(c) Simplify

   (i) $16^{-\frac{1}{2}}$,

....

....

   (ii) $125^{\frac{2}{3}}$.

....

....

....

[4]

14. Express $0.\overset{..}{3}\overset{.}{7}$ as a fraction.

[2]

22. Given that $x = \sqrt{12}, y = \sqrt{3}$ and $z = \sqrt{6},$ simplify **each** of the following, indicating in each case whether your answer is rational or irrational.

(a) $xy - 4$

....

....

(b) $\dfrac{x}{yz^2}$

....

....

(c) $(y + z)^2$

....

....

[5]