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) $\frac{f}{de}$

[2]

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

.....

.....

.....

.....

[2]

17. *(a)* Express $0\dot{3}4\dot{2}7$ as a fraction.

[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 $(\sqrt{32}+\sqrt{2})^2$.

[2]

18. *(a)* Express $0\cdot\dot{6}\dot{2}\dot{4}$ as a fraction.

[2]

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

[2]

(c) Simplify

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

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

[4]

14. Express $0\dot{3}\dot{7}$ 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]