Answer key

The method: Domain

The domain is every x you are allowed to use. A denominator cannot be 0, and what is under a square root must be 0 or more. Write $x \neq 3$ or $x \geq 3$.

$f(x) = \frac{x + 3}{x - 1}$ domain: $x \neq 1$

$x - 1 = 0$ when $x = 1$ the denominator cannot be 0

$f(x) = \sqrt{x - 9}$ domain: $x \geq 9$

$x - 9 \geq 0$ what is under the root must be 0 or more

$x \geq 9$

$f(x) = \sqrt{-x - 6}$ domain: $x \leq -6$

$-x - 6 \geq 0$ what is under the root must be 0 or more

$-6 \geq x$ add x to both sides

$x \leq -6$

Problems 1 and 2 worked out · Version 0A

$f(x) = \frac{x + 5}{x^2 - 2x - 15}$ domain: $x \neq -3, x \neq 5$

$x^2 - 2x - 15 = (x + 3)(x - 5)$ factor the denominator

It is 0 when $x = -3$ or $x = 5$. the denominator cannot be 0

$f(x) = \sqrt{4x - 12}$ domain: $x \geq 3$

$4x - 12 \geq 0$ what is under the root must be 0 or more

$4x \geq 12$

$x \geq 3$

Domain · Version 0A

1) $x \neq -3, x \neq 5$ 2) $x \geq 3$ 3) $x \neq -6, x \neq -3$
4) $x \neq -6$ 5) $x \neq -8$ 6) $x \geq -2$ 7) $x \leq -5$
8) $x \leq 9$ 9) $x \neq -2$ 10) $x \leq -2$
11) $x \neq -4, x \neq -3$ 12) $x \leq 0$