

1. Solve for x : $3(x - 4) = 4 - 2(x + 2)$

$$3x - 12 = 4 - 2x - 4$$

$$3x - 12 = -2x$$

$$5x = 12$$

$$x = \frac{12}{5}$$

2. Find the domain of the function $f(x) = \frac{\sqrt{x-1}}{x-2}$.

First, we need the denominator to not be 0, so

$$x - 2 \neq 0 \implies x \neq 2$$

Also we need for the expression under the radical to be non-negative, so

$$x - 1 \geq 0$$

$$x \geq 1$$

Therefore the domain is $x \geq 1$ with $x \neq 2$

3. Find the equation of the line through $(6, -4)$ that is parallel to the line $4x - 5y = 6$.

First we find the slope of the given line:

$$4x - 5y = 6$$

$$4x - 6 = 5y$$

$$\frac{1}{5}(4x - 6) = y$$

$$y = \frac{4}{5}x - \frac{6}{5}$$

So the slope of the given line is $\frac{4}{5}$. Since we want a line parallel to this one, it has the same slope. Therefore, we just need the equation of the line with slope $\frac{4}{5}$ that goes through $(6, -4)$. Using point-slope form, we have:

$$y - (-4) = \frac{4}{5}(x - 6)$$

$$y + 4 = \frac{4}{5}(x - 6)$$