Name: _____ 5-a-day Higher Plus

1st January

Corbettmaths

Prove $(2n + 2)^2 - (2n + 1)$ is always odd.

$= (2n+2)(2n+2) - (2n+1)$

$= 4n^2 + 8n + 4 - 2n - 1$

$= 4n^2 + 6n + 3$

$= 4n^2 + 6n + 2 + 1$

$= 2(2n^2 + 3n + 1) + 1$ → even + 1 = odd

Rationalise the denominator

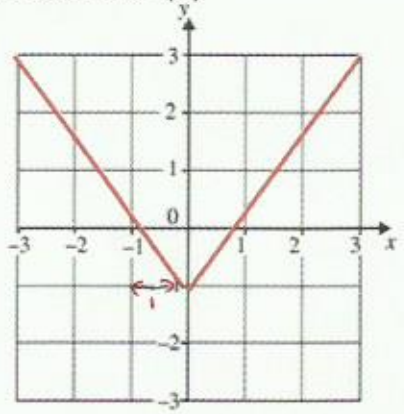
$$\frac{3 + \sqrt{2}}{\sqrt{3}}$$

$= \frac{\sqrt{3}}{\sqrt{3}}\left(\frac{3+\sqrt{2}}{\sqrt{3}}\right)$

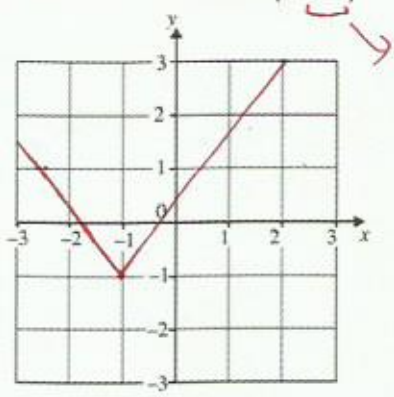
$= \frac{3\sqrt{3} + \sqrt{6}}{3}$

$= \sqrt{3} + \frac{\sqrt{6}}{3}$

Shown is f(x)



Sketch the function f(x + 1)



→ shift 1 unit left (translate)

$f(x) = 3x + 2$

$g(x) = x^2$

Find fg(x) $= f(x^2)$

$= 3x^2 + 2$

Find gf(5) $= g(3x + 2)$

$= (3x + 2)^2$

$x = 5 \rightarrow = 17^2$

$= 289$