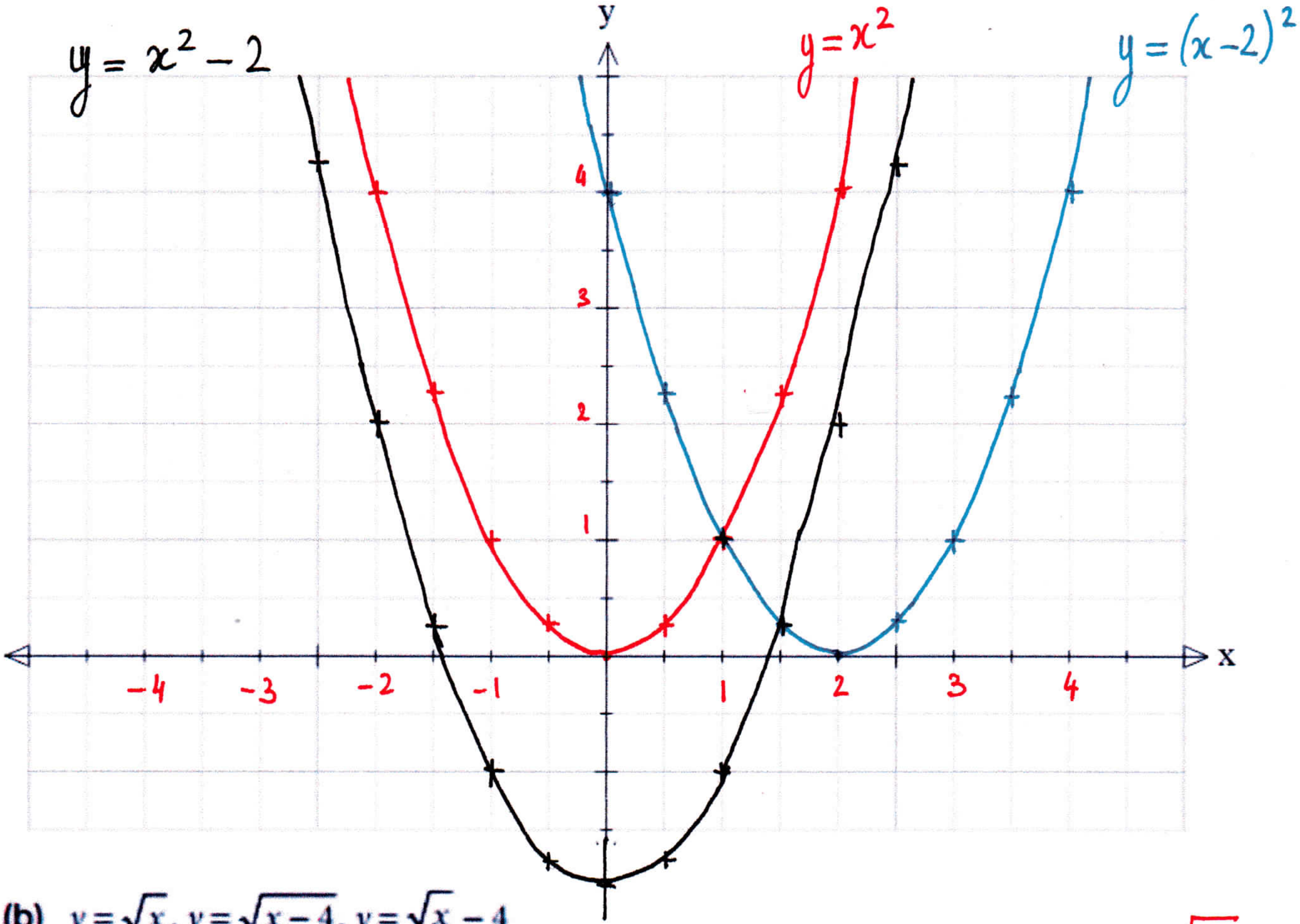
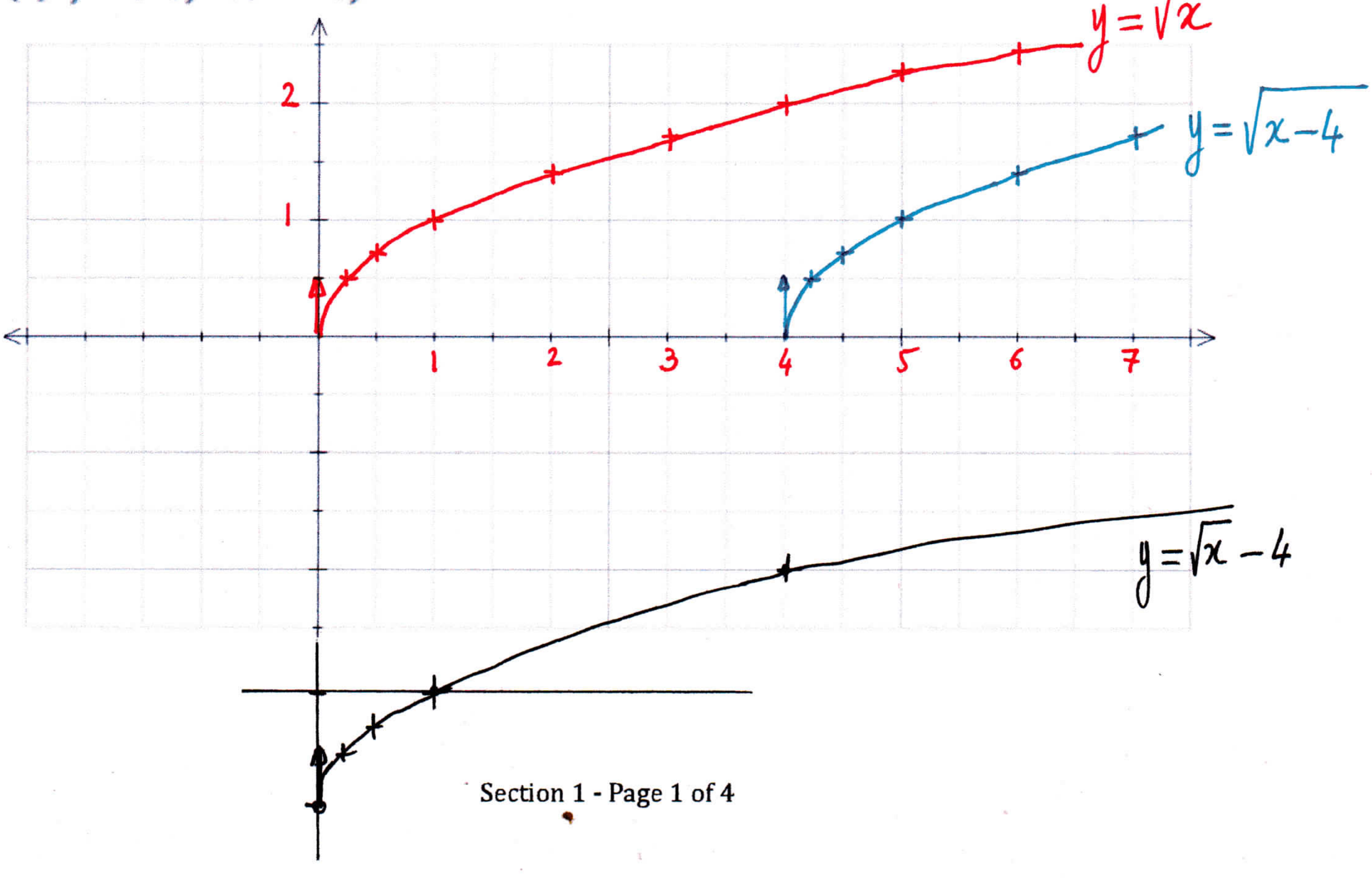
TRANSFORMATIONS OF GRAPHS USING $y = f(x+b)$ AND $y = f(x)+c$

1 On the same diagram, draw the graphs of:

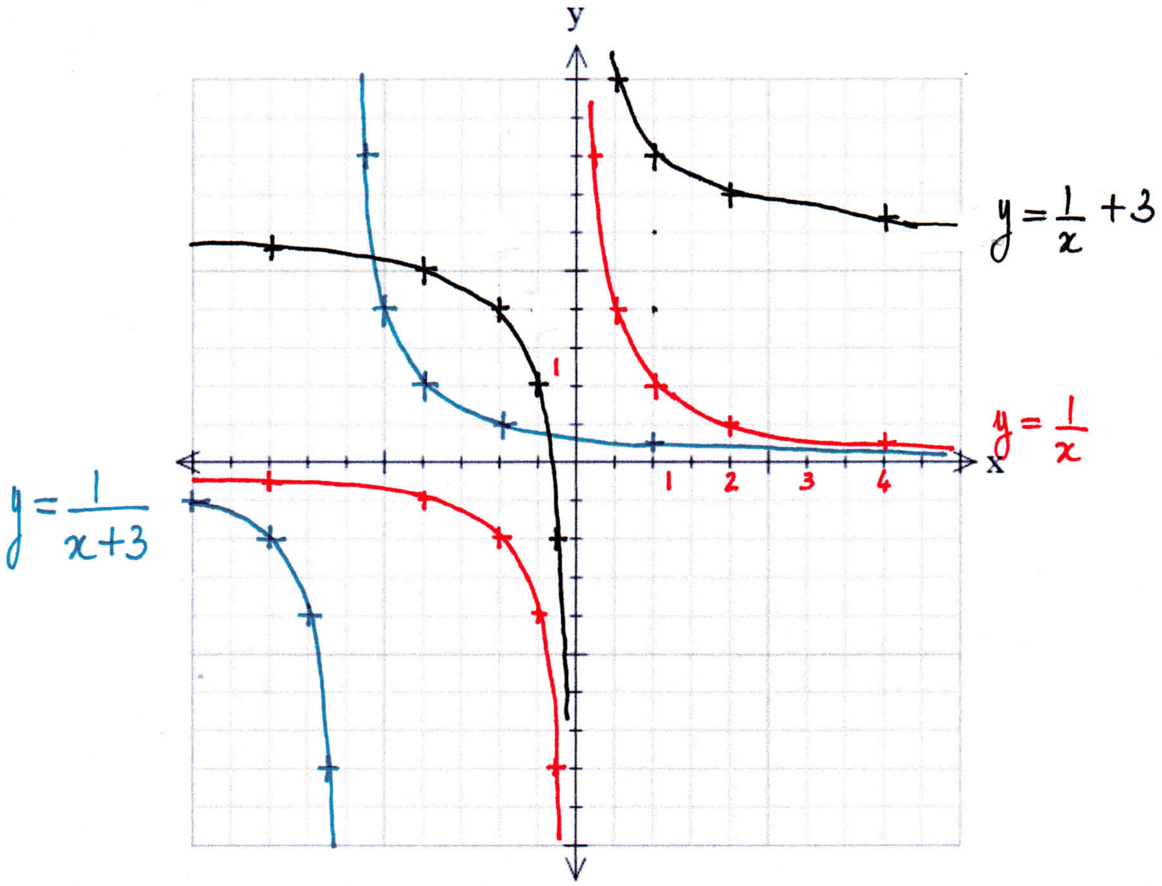
(a) $y = x^2$, $y = (x-2)^2$, $y = x^2 - 2$



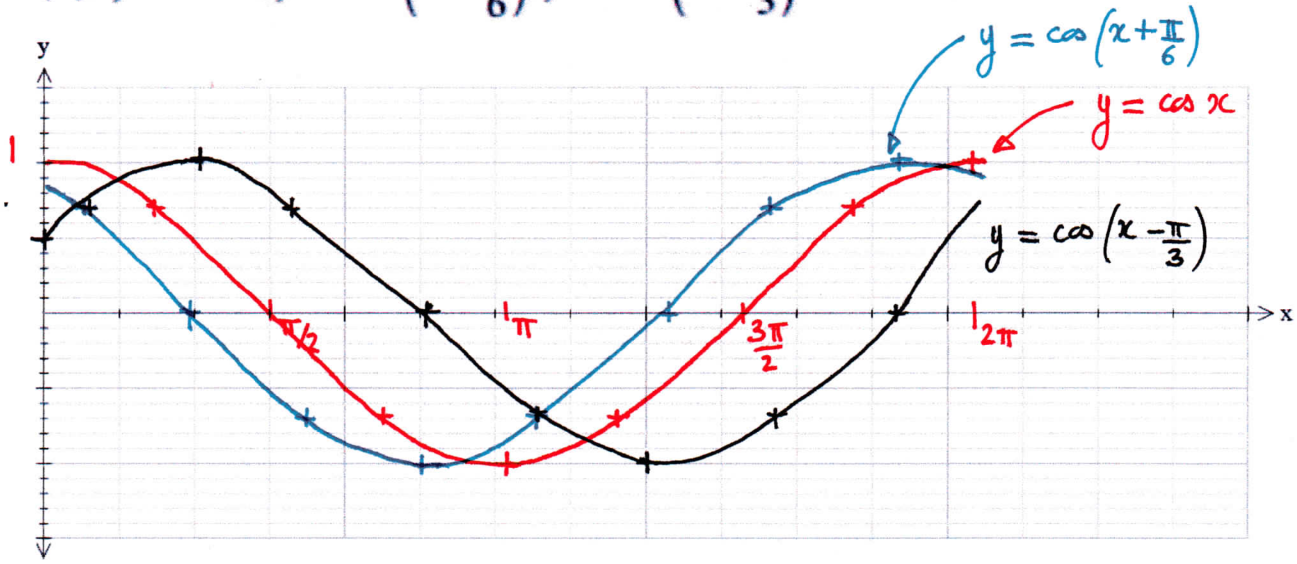
(b) $y = \sqrt{x}$, $y = \sqrt{x-4}$, $y = \sqrt{x} - 4$



(c) $y = \frac{1}{x}, y = \frac{1}{x+3}, y = \frac{1}{x} + 3$

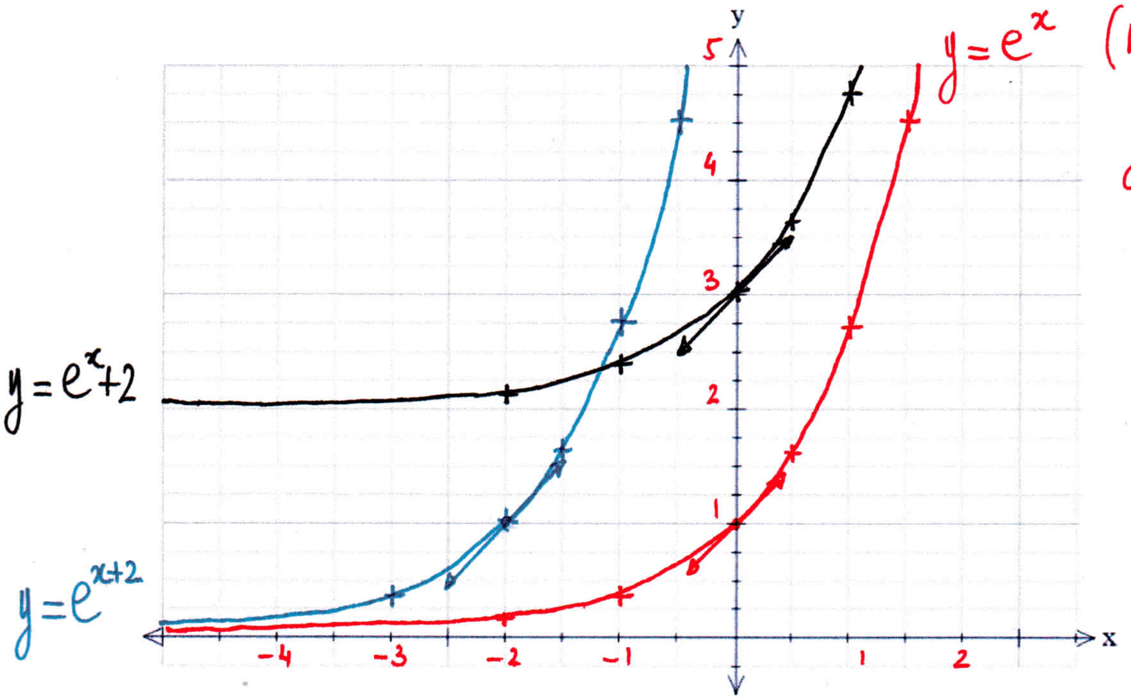


(d) $y = \cos x, y = \cos\left(x + \frac{\pi}{6}\right), y = \cos\left(x - \frac{\pi}{3}\right)$ for $0 \le x \le 2\pi$.

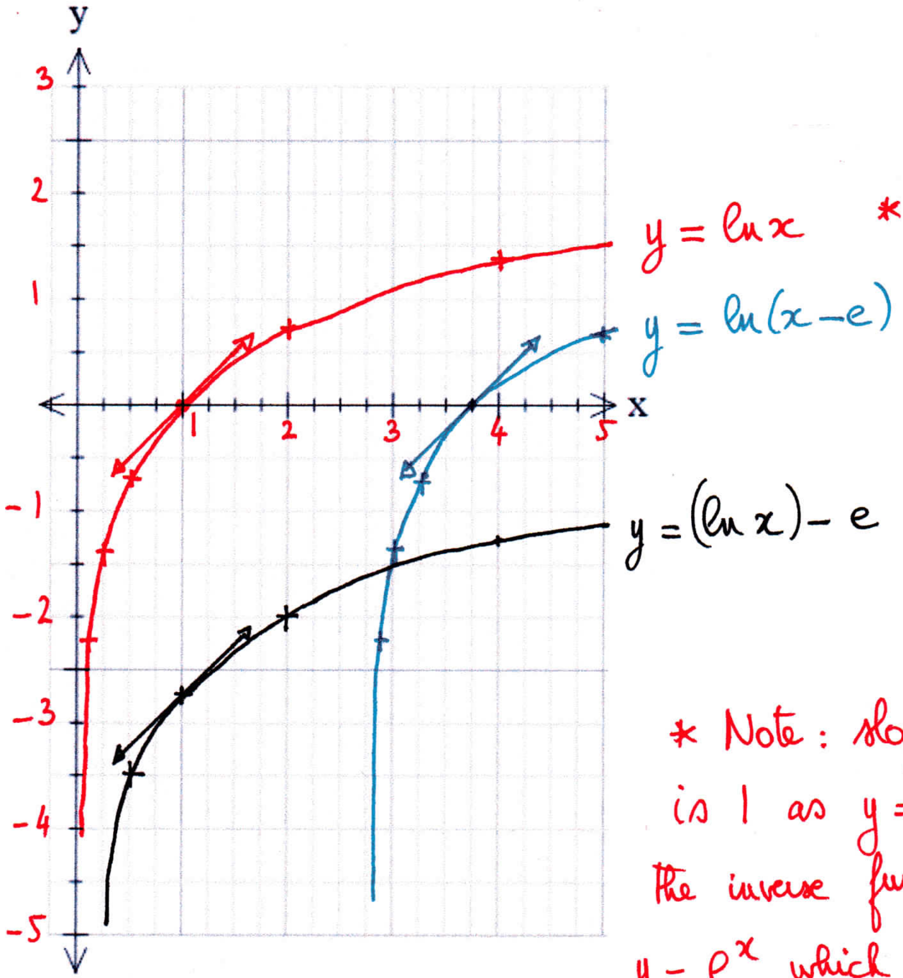


TRANSFORMATIONS OF GRAPHS USING $y = f(x+b)$ AND $y = f(x)+c$

(a) $y = e^x, y = e^{x+2}, y = e^x + 2$

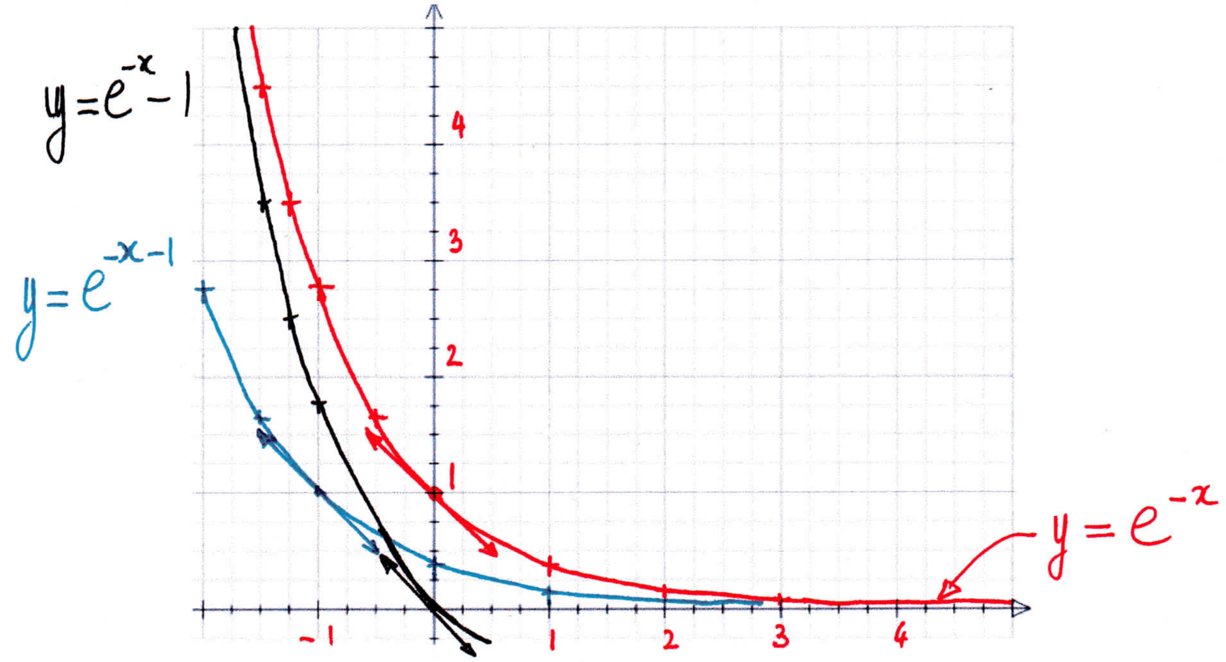


(b) $y = \ln x, y = \ln(x - e), y = \ln x - e$



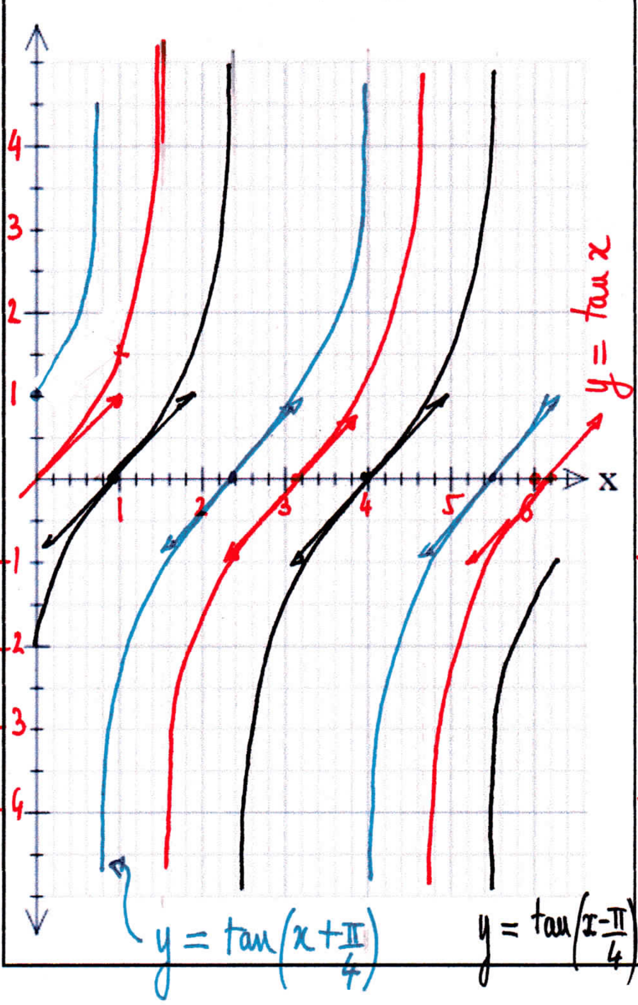
* Note: slope at (1,0) is 1 as $y = \ln x$ is the inverse function of $y = e^x$, which slope is 1 at (0,1) - by definition of e, and both curves are symmetrical with $y = x$.

(c) $y = e^{-x}, y = e^{-x-1}, y = e^{-x} - 1$



3 On the same diagram, draw the following graphs for $0 \le x \le 2\pi$:

(b) $y = \tan x, y = \tan\left(x + \frac{\pi}{4}\right), y = \tan\left(x - \frac{\pi}{4}\right)$



(c) $y = \operatorname{cosec} x, y = \operatorname{cosec}\left(x + \frac{\pi}{4}\right), y = \operatorname{cosec}\left(x - \frac{\pi}{2}\right)$