Plotting with MATLAB
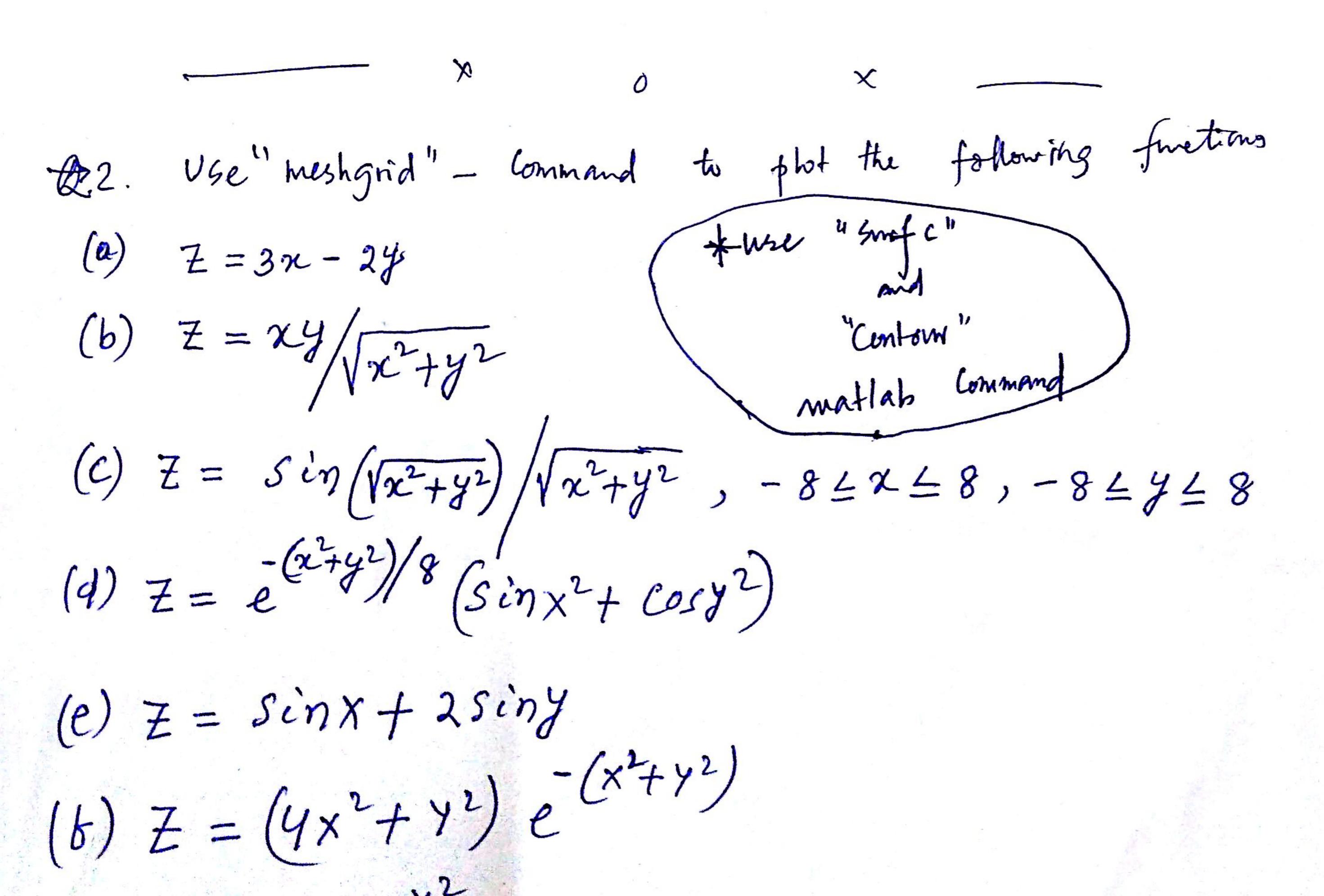
1. Plot the followings and add xlabel, ylabel, and title to your figure

   (a) $x = [0\ 1\ 3\ 5\ 7\ 8]$, $y = [0\ 9\ -5\ 8\ 2\ 7]$. Type plot(x, y).

   (b) plot the parabolas $y = x^2$ and $y = -x^2$ in $[-10, 10]$.

   (c) plot $y = x^3$ in the interval $[-10, 10]$, using the command fplot ($`x^3`, [-10, 10]$).

   (d) For $k \in \{-0.0004, -0.0002, -0.006\}$, plot $y = 10\exp(kx)$ in $[0, 10^5]$. Use semi $-$ log along x-axis. Use holdon so that in a single figure you plot all the circles. Add different color to different figures. Change the 'line width' of each figure

   (e) plot y vs x for the parametric curves $x(t) = \dfrac{2t\cos(t)}{t+1}$, $y(t) \doteq \dfrac{2t\sin(t)}{t+1}$, $t = [0, 4\pi]$.

   (f) For each choice of $a, b \in \{-5, -4, -2, 0, 2, 4, 5\}$, plot y vs x for the circle $(x+a)^2 + (y-b)^2 = 4$, where $x(t) = 2\cos(t) - a$, $y(t) = 2\sin(t) + b$. Use holdon so that in a single figure you plot all the circles. Add different color to different figures. Change the 'line width' of each figure.

   (g) Do the above problem 7, but using subplot command.

   (a) Polar coordinate system.

   (b) Let $\theta = [0, 2\pi]$, plot $\rho = \sin(2\theta)\cos(2\theta)$, using matlab command polar (θ, ρ).

   (c) Plot $\rho = \theta^2$ with $0 \le \theta \le 5\pi$ in polar coordinates.

$\times$ 0 $\times$

Q2. Use "meshgrid" $-$ Command to plot the following functions

(a) $Z = 3x - 2y$

(b) $Z = xy/\sqrt{x^2 + y^2}$

*use "surf c" and "Contour" matlab Command

(c) $Z = \sin(\sqrt{x^2 + y^2})/\sqrt{x^2 + y^2}$, $-8 \le x \le 8$, $-8 \le y \le 8$

(d) $Z = e^{-(x^2+y^2)/8}(\sin x^2 + \cos y^2)$

(e) $Z = \sin x + 2\sin y$

(f) $Z = (4x^2 + y^2)e^{-(x^2+y^2)}$

(g) $Z = xye^{-y^2}$

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(h) $Z = x^2 y - 2y$