1.

1. : x’ = f’\*x/z, y’ = f’\*y/z

So for the perspective projection : x’ = f’\*(x0+ta)/z , y’ = (y0+tb)/z

For the orth projection: x’ = x, y’ = y,

1. : Yes, the perspective projection of the line is also a line in the image, because the x’ and y’ is also a linear function of t, so the perspective projection of the line is also a line.
2. : Yes, the orthographic projection of the line is also a line, because in orthorgraphic projection, x’ = 0.5, it is constant line , and y’ = -1+t , so y’ is a linear function of t.
3. : the program and the images are alreay generated.
4. : since x’ = 0.5/-t, y’ = -1+t/-t = (-1/t )- 1 for perspective projection, so when t goes ∞, then the x’ and y’ will goes to a very very small value, close to zero,so at this condition, the perspective projection may turn to a single point in the image. It is consistant with the image that i generated.

2:

1. :

Since x’ = f’\*x/z, y’ = f’\*y/z

So for the perspective projection : x’ = f’\*(x1+ ta)/z, y’ = f’\*(y1+tb)/z

For the orth projection: x’ = x1+ta, y’ = y1+tb,

1. : the images are already generated.
2. : yes, the projections of the lines in the image will be parallel, because the slopes of two lines are equals whatever in perspective or orthorgraphic projections, so the two lines will be parallel.
3. : yes, the answer of part c) is consistent with that my programs generated.
4. : Yes, it is a good apporximation. Because the two lines are parallel to the plane and each other.

f): when z0 = |f’|,the x’ and y’ for perspective projection will become x’ = x, y’ = y, which this will equals to the orthographic projection. So the images of perspective projection will be the same as the images of the perspective projection.

3:

a): So for the perspective projection : x’ = f’\*x/z, y’ = f’\*y/z => x’ =f’\*x1/z , y’ = f’\*(y0+tb)/z

For the orthographic projections: x’ = x1, y’ = y0+tb

b):the images are already generated.

c): No, they are not parallel, because the slopes of two lines are not equal to each other.

d): Yes, the answer is consistent with the images that my programs generated.

e): No, it is not a good approximation to perspective projection for this problem.Because these two lines are not parallel to this plane.

1. :The perspective projection may turn to a single point in the image. It is consistant with the image that i generated.