

# Exam 1 Practice Problems

## Part I - Lines and Linear Models

1. What are the intercepts for a line passing through the point  $(2, -1)$  with a slope of 3? Graph this line.
2. At a price of \$45, 20 purses can be sold. If the price is decreased by \$15, then an additional 30 purses can be sold. Find the demand equation for these purses in slope-intercept form. If the store wants to sell 50 purses, what price should they charge?
3. A company makes bumper stickers. The fixed costs are \$600 and the bumper stickers cost 50 cents each to make. The stickers sell for \$2.00 each. Find and interpret the break-even point for these bumper stickers.
4. The table below shows the number of widgets supplied by the BW company at different prices (in dollars). Find the equation for the least-squares line for this data. Use this equation to determine the lowest price the BW company is willing to accept for these widgets. If the market will pay \$50 per widget, how many widgets will be supplied?

Number of widgets	3	4	7	9	14
Price per widget (in dollars)	25	27	35	40	60

5. A calculator is purchased for \$120 and sold 6 months later for \$30. Find the rate of depreciation for this calculator. Graph the depreciation line.
6. The supply of lamps can be modeled by  $3p - 4x = 24$ . The demand for lamps is given by  $4p + 5x = 50$ . In these models  $x$  is the number of lamps supplied in thousands and  $p$  is the price in Euros. Graph the supply and demand equations. Find and interpret the equilibrium point.
7. Line  $L$  is given by  $3y - 4x = 16$ .
  - (a) Find the equation of the line that is parallel to  $L$  and passes through the point  $(-3, 4)$ .
  - (b) Find the equation of the line that is perpendicular to  $L$  and passes through the point  $(4, -6)$ .