1. [4 points] A small candy company called Wonky Bars sells two types of candy: chocolate bars and gummy worms. They have found that the number of chocolate bars sold, C, is inversely proportional to the square of g, the number of bags of gummy worms sold. At one point, Wonky Bars sold 150 chocolate bars and 30 bags of gummy worms.
Give a formula for $C = f(g)$, the number of chocolate bars Wonky Bars sold when they sold g bags of gummy worms. *You do not need to simplify your answer.*

Answer: $f(g) =$ _____

2. [10 points] The parts of this problem are not related.

a. [2 points] If $p(x)$ is a polynomial of degree 5 such that $\lim_{x\to\infty} p(x) = \infty$ and $\lim_{x\to-\infty} p(x) = -\infty$, which of the following are possible leading terms of $p(x)$?
Circle all correct options.

$5x^3$ $\quad -5x^3$ $\quad -\frac{1}{2}x^5$ $\quad 3x^5$ $\quad -2x^5$ $\quad \frac{3}{4}x^5$ $\quad$ None of these

b. [2 points] If $q(x)$ is a polynomial such that $\lim_{x\to\infty} q(x) = -\infty$ and $\lim_{x\to-\infty} q(x) = \infty$, which of the following are possible degrees of $q(x)$?
Circle all correct options.

5 $\quad$ 600 $\quad$ -1 $\quad$ 755 $\quad$ 2 $\quad$ None of these

c. [2 points] Which of the following functions approach 0 as $x \to -\infty$?
Circle all correct options.

$\frac{x^2+8x^3}{x(6+x)(2x-1)}$ $\quad \frac{e^x+3}{x^2+1}$ $\quad \frac{2^x+5}{3^x+7}$ $\quad \frac{1}{\ln(-x)}$ $\quad$ None of these

d. [2 points] Which of the following functions dominates all the others as $x \to \infty$?
*Circle exactly **one** of the options.*

$100x + 650$ $\quad 5e^x$ $\quad 2(3)^x$ $\quad 2(3)^{-x}$ $\quad 15x^4 + x + 6$ $\quad 75x^{500}$

e. [2 points] If θ is an angle with $\cos(\theta) = a$ for some positive number a, which of the following values must also equal a? *Circle all correct options.*

$\cos(-\theta)$ $\quad \cos(\pi - \theta)$ $\quad \cos(2\pi - \theta)$ $\quad \cos(\pi + \theta)$ $\quad$ None of these