

1. Problem 5.13, p.228.
2. Suppose that the r.v.  $X$  is uniformly distributed on  $(0, a)$  and that  $Y = e^{X^2}$ .
  - (a) What are the possible values of  $Y$ ?
  - (b) Find the d.f. and p.d.f. of  $Y$ . Be sure to specify  $f_Y(y)$  for all real  $y$  except for  $y$  in a finite set.
  - (c) Find  $P(0 < X^3 < .5)$  when  $a = 1$ .
3. Suppose that  $X$  has a beta distribution with parameters  $a = 3$  and  $b = 2$ .
  - (a) Find the pdf of  $X$ . Expressions involving  $\Gamma$  should be converted to explicit numbers.
  - (b) Find the median and the mode of  $X$ .
  - (c) Sketch the graph of the p.d.f. of  $X$ .
  - (d) Find  $P(0 < X < .5)$ .
4. Repeat Problem 3, where now  $X$  has a gamma distribution with parameters  $\alpha = 2$  and  $\lambda = 1$ .
5. Problem 6.19 on p.288, but replace  $1/x$  by  $2/x$  and  $0 < y < x < 1$  by  $0 < y < x^2 < 1$ . In addition to (a), (b), (c), (d), do
  - (e) Find  $P(A)$ , where  $A$  is the rectangle  $[\frac{1}{2}, 1] \times [0, \frac{1}{4}]$ .
6. Problem 6.1b on p.287, but assume the die has only 4 sides.

Recommended Problems: Work some from the end of Chapter 5 and the beginning of Chapter 6.