Review Problems

1. Translate an 18% discount rate to interest rate.

2. We wish to buy a used car for \$5000. The dealership has a finance plan of \$500 down payment and 36 monthly payments with an APR of 6%. Find the monthly payment under this plan.

3. We wish to buy a used car for \$7500. The dealership has a finance plan of \$500 down payment and 48 monthly payments of \$161.20. Find the APR that the bank charges.

months	4%	4.5%	5%	5.5%	6%	6.5%	7%	7.5%	8%	8.5%	9%
6	1.17	1.32	1.46	1.61	1.76	1.90	2.05	2.20	2.35	2.49	2.64
12	2.18	2.45	2.73	3.00	3.28	3.56	3.83	4.11	4.39	4.66	4.94
18	3.20	3.60	4.00	4.41	4.82	5.22	5.63	6.04	6.45	6.86	7.28
24	4.22	4.75	5.29	5.83	6.37	6.91	7.45	8.00	8.54	9.09	9.64
30	5.25	5.92	6.59	7.26	7.94	8.61	9.30	9.98	10.66	11.35	12.04
36	6.29	7.09	7.90	8.71	9.52	10.34	11.16	11.98	12.81	13.64	14.48
48	8.38	9.46	10.54	11.63	12.73	13.83	14.94	16.06	17.18	18.31	19.45
60	10.50	11.86	13.23	14.61	16.00	17.40	18.81	20.23	21.66	23.10	24.55

4. Consider a circle with radius 5 ft.

   (a) Find the circumference of the circle. Include units in your computation and answer.

   (b) Find the area of the circle. Include units in your computation and answer.

   (c) Find the volume of a cylinder that has this circle as its base and a height of 18 ft.

   (d) Find the volume of a cone that has this circle as its base and a height of 18 ft.

5. We placed \$1000 in a bank account with an annual compound interest rate of 8%. How much money do we have in the bank after 15 if the bank compounds

   (a) annually

   (b) monthly

   (c) daily

   (d) continuously

6. We randomly pull two numbers from $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, with replacement. Find the probability that

   (a) The product of the two numbers pulled is even.

   (b) The sum of the two numbers pulled is 9.

   (c) The sum of the two numbers pulled is 12.

7. We randomly pull two numbers from $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, with no replacement. Find the probability that

   (a) The product of the two numbers pulled is even.

   (b) The sum of the two numbers pulled is 9.

   (c) The sum of the two numbers pulled is 12.

8. The supplement of an angle is 4° less than six times the angle. Find the angle.

9. There are 14 marbles in a bag: 9 blue, 3 yellow, and 2 green. We randomly pull two marbles Find the probability for each of the following events.

   (a) We pull two yellow marbles. Assume

      i. replacement
      ii. no replacement

   (b) We pull no yellow marbles. Assume

      i. replacement
      ii. no replacement

   (c) We pull at least one yellow marble. Assume

      i. replacement
      ii. no replacement

   (d) We pull a green marble first and then a blue one. Assume

      i. replacement
      ii. no replacement

   (e) We pull a green and a blue marble, not necessarily in this order. Assume

      i. replacement
      ii. no replacement

   (f) We pull two marbles of the same color.

      i. replacement
      ii. no replacement

   (g) We pull two marbles of different colors.

      i. replacement
      ii. no replacement

Review Problems - Answers

1. Translate an 18% discount rate to interest rate. $\frac{18}{82} = 0.219\,51 \cong 21.95\%$

2. We wish to buy a used car for \$5000. The dealership has a finance plan of \$500 down payment and 36 monthly payments with an APR of 6%. Find the monthly payment under this plan. \$136.90

3. We wish to buy a used car for \$7500. The dealership has a finance plan of \$500 down payment and 48 monthly payments of \$161.20. Find the APR that the bank charges. 5%

4. Consider a circle with radius 5 ft.

   (a) Find the circumference of the circle. Include units in your computation and answer. $C = 10\pi$ ft $\cong 31.415\,93$ ft

   (b) Find the area of the circle. Include units in your computation and answer. $A = 25\pi$ ft$^2 \cong 78.539\,8$ ft^2

   (c) Find the volume of a cylinder that has this circle as its base and a height of 18 ft. $V = 450\pi$ ft$^3 \cong 1413.716\,7$ ft^3

   (d) Find the volume of a cone that has this circle as its base and a height of 18 ft. $V = 150\pi$ ft$^3 \cong 471.238\,9$ ft^3

5. We placed \$1000 in a bank account with an annual compound interest rate of 8%. How much money do we have in the bank after 15 if the bank compounds

   (a) annually \$ 3172.17

   (b) monthly \$ 3306.92

   (c) daily \$ 3319.67

   (d) continuously \$ 3320.12

6. We randomly pull two numbers from $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, with replacement. Find the probability that

   (a) The product of the two numbers pulled is even. $\frac{3}{4}$

   (b) The sum of the two numbers pulled is 9. $\frac{2}{25}$

   (c) The sum of the two numbers pulled is 12. $\frac{9}{100}$

7. We randomly pull two numbers from $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, with no replacement. Find the probability that

   (a) The product of the two numbers pulled is even. $\frac{7}{9}$

   (b) The sum of the two numbers pulled is 9. $\frac{4}{45}$

(c) The sum of the two numbers pulled is 12. $\frac{4}{45}$

8. The supplement of an angle is 4° less than six times the angle. Find the angle. 27°

9. There are 14 marbles in a bag: 9 blue, 3 yellow, and 2 green. We randomly pull two marbles Find the probability for each of the following events.

(a) We pull two yellow marbles. Assume

i. replacement $\left(\frac{3}{14}\right)\left(\frac{3}{14}\right) = \frac{9}{196}$

ii. no replacement $\left(\frac{3}{14}\right)\left(\frac{2}{13}\right) = \frac{3}{91}$

(b) We pull no yellow marbles. Assume

i. replacement $\left(\frac{11}{14}\right)\left(\frac{11}{14}\right) = \frac{121}{196}$

ii. no replacement $\left(\frac{11}{14}\right)\left(\frac{10}{13}\right) = \frac{55}{91}$

(c) We pull at least one yellow marble. Assume

i. replacement $1 - \frac{121}{196} = \frac{75}{196}$

ii. no replacement $1 - \frac{55}{91} = \frac{36}{91}$

(d) We pull a green marble first and then a blue one. Assume

i. replacement $\left(\frac{2}{14}\right)\left(\frac{9}{14}\right) = \frac{9}{98}$

ii. no replacement $\left(\frac{2}{14}\right)\left(\frac{9}{13}\right) = \frac{9}{91}$

(e) We pull a green and a blue marble, not necessarily in this order. Assume

i. replacement $\left(\frac{2}{14}\right)\left(\frac{9}{14}\right) + \left(\frac{9}{14}\right)\left(\frac{2}{14}\right) = \frac{9}{49}$

ii. no replacement $\left(\frac{2}{14}\right)\left(\frac{9}{13}\right) + \left(\frac{9}{14}\right)\left(\frac{2}{13}\right) = \frac{18}{91}$

(f) We pull two marbles of the same color.

i. replacement $\left(\frac{9}{14}\right)\left(\frac{9}{14}\right) + \left(\frac{3}{14}\right)\left(\frac{3}{14}\right) + \left(\frac{2}{14}\right)\left(\frac{2}{14}\right) = \frac{47}{98}$

ii. no replacement $\left(\frac{9}{14}\right)\left(\frac{8}{13}\right) + \left(\frac{3}{14}\right)\left(\frac{2}{13}\right) + \left(\frac{2}{14}\right)\left(\frac{1}{13}\right) = \frac{40}{91}$

(g) We pull two marbles of different colors.

i. replacement $1 - \frac{47}{98} = \frac{51}{98}$

ii. no replacement $1 - \frac{40}{91} = \frac{51}{91}$