Math 118 **Sample Exam 3** Answers

1. A book went on a 15% sale. The sale price is \$ 40. 80. Find the original price. \$ 48

2. The population of a town has decreased from 120 000 to 104 400. What precent of a change does this represent? 13% decrease

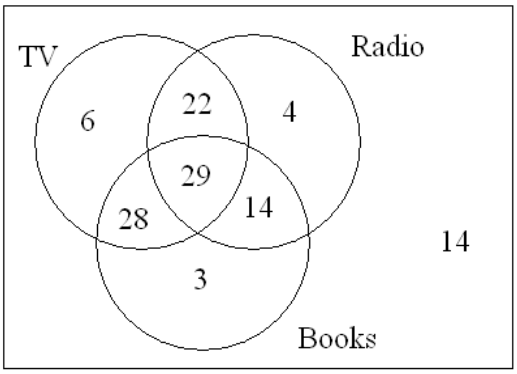
3. We borrowed \$2400 for two years, with a simple annual interest rate of 10%. After 7 months, we make a partial payment of \$900. After an additional 6 months, we make another partial payment of \$1000. How much do we owe at the end of the two years? \$788. 18

4. We placed \$2000 into a bank account with an annual compound interest rate of 8%. How much money do we have after 15 years if the bank compounds

   (a) annually \$6344. 34
   (b) semi-annually \$6486. 80
   (c) monthly \$6613. 84
   (d) daily (use 1 year = 360 days) \$6639. 35

5. We asked 120 people if they listen to radio, watch TV or read books. 85 watch TV, 69 listen to radio, and 74 read books. 51 watch TV and listen to radio, 57 watch TV and read books, and 43 listen to radio and read books. 29 do all three.

   (a) Draw a Venn diagram depicting the information given.



   (b) How many people only listen to radio? 4
   (c) How many people read books or watch TV? 102
   (d) How many people do neither of these? 14
   (e) We randomly pick a person among the people listening to radio. What is the probability that he also reads books? $\frac{43}{69}$
   (f) We randomly pick a person among the people reading books . What is the probability that he also listens to radio? $\frac{43}{74}$

6. Find the sum $\binom{6}{0} + \binom{6}{2} + \binom{6}{4} + \binom{6}{6} =$ 32

7. How many 6−element subsets does a set X have if $n(X) = 12$? 924

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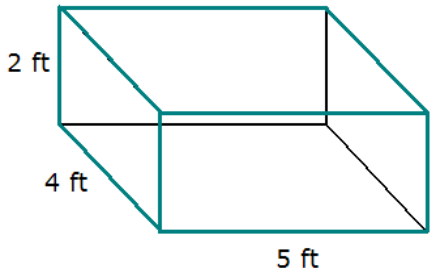
8. A cone has a height of 15 in and a circular base with radius 6 in. Find the volume of the cone. $180\pi \cong 565.49 \text{ in}^3$

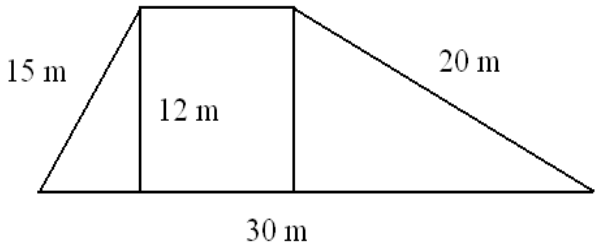
9. Find the distance between the points $(2, -6)$ and $(-6, 9)$. 17

10. The supplement of an angle is $24°$ less than twice the angle. Find this angle. $68°$

11. Find the volume of the rectangular prism shown on the picture below. 40 ft^3



12. Find the area and perimeter of the trapezoid shown on the picture below. Include units in your computation and answer. $P = 70 \text{ m}$, $A = 210 \text{ m}^2$



13. We throw a die twice in a row.

    (a) Find the probability of the second number rolled being larger than the first number rolled. $\frac{15}{36} = \frac{5}{12}$

    (b) Find the probability of the sum of the two numbers rolled being 6. $\frac{5}{36}$

    (c) Find the probability of the product of the two numbers rolled being 6. $\frac{4}{36} = \frac{1}{9}$

    (d) Find the probability of the sum of the two numbers rolled being odd. $\frac{1}{2}$

    (e) Find the probability of the product of the two numbers rolled being odd. $\frac{1}{4}$

14. We toss a coin 10 times in a row.

    (a) What is the total number of outcomes? 1024

    (b) Find the probability of 3 heads and 7 tails. $\frac{\binom{10}{3}}{2^{10}} = \frac{15}{128}$

(c) Find the probability of 5 heads and 5 tails. $\frac{\binom{10}{5}}{2^{10}} = \frac{63}{256}$

(d) Find the probability of the number of tails being 3 or more. $\frac{2^{10} - \left(\binom{10}{0} + \binom{10}{1} + \binom{10}{2}\right)}{2^{10}} = \frac{121}{128}$