SHORT ANSWER (Work not required to be shown)

13. Let the universal set $U = \{1, 2, 3, 4, 5, 6, 7\}$. Let $A = \{1, 4, 5\}$ and $B = \{4, 5, 7\}$.

Determine the set $A' \cup B$. Answer: _____

(Be sure to notice the complement symbol applied to A)

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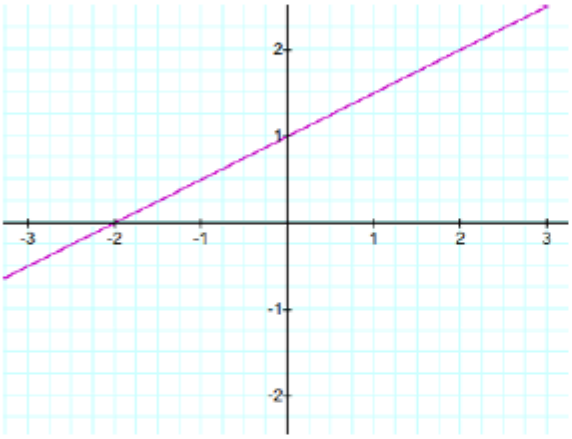
14. Consider the following graph of a line.



(a) State the x-intercept. Answer: _____

(b) State the y-intercept. Answer: _____

(c) Determine the slope. Answer: _____

(d) Find the slope-intercept form of the equation of the line. Answer: _____

(e) Write the equation of the line in the form $Ax + By = C$ where A, B, and C are integers.

Answer: _____

15. 400 employees at a particular company were asked their status (full-time or part-time) and their primary means of transportation to and from work. The following table was obtained.

Primary Transportation	Full-time	Part-time	Total
Car	188	60	248
Bus	32	44	76
Subway	30	27	57
On Foot	10	9	19
Total	260	140	400

(Report your answers as fractions or as decimal values rounded to the nearest hundredth.)

Find the probability that a randomly selected employee:

(a) travels by subway and is part-time. Answer: _____

(b) travels by subway or is part-time. Answer: _____

(c) travels by subway, given that the employee is part-time. Answer: _____

SHORT ANSWER, with work required to be shown, as directed.

16. For an eight year period, Erica deposited $700 each quarter into an account paying 3.6% annual interest compounded quarterly. (Round your answers to the nearest cent.)

(a) How much money was in the account at the end of 8 years? **Show work.**

(b) How much interest was earned during the 8 year period? **Show work.**

Erica then made no more deposits or withdrawals, and the money in the account continued to earn 3.6% annual interest compounded quarterly, for 3 more years.

(c) How much money was in the account after the 3 year period? **Show work.**

(d) How much interest was earned during the 3 year period? **Show work.**

17. A contest has 16 finalists. One finalist is awarded first prize, another finalist is awarded second prize, another is awarded third prize, and another is awarded fourth prize. How many different ways could the four prizes be awarded? **Show work.**

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18. There is a collection of 11 books. 6 of the books are fiction and 5 of the books are non-fiction. As an assignment, a student must read 5 of the books over the summer.

(a) In how many ways can 5 of the 11 books be chosen? **Show work.**

(b) In how many ways can the 5 books be chosen, if 3 of the books must be fiction and 2 of the books must be non-fiction? **Show work.**

(c) If 5 books are selected at random from the collection of 11 books, what is the probability that 3 are fiction and 2 are non-fiction? *Give answer as a fraction or as a decimal rounded to nearest ten-thousandth (4 places after decimal)* **Show work.**

19. A 2012 report by the Animal Pet Products Association stated Americans spent \$30 billion on their pets in 2002. By 2011, that number measured \$51 billion. Let y = amount (in \$ billions) Americans will spend on their pets in year x, where $x = 0$ represents the year 2002.

(a) Which of the following linear equations could be used to predict the amount y (in \$ billions) Americans spend on their pets in a given year x, where $x = 0$ represents the year 2002? **Explain/show work.**

A. $y = -2.33x - 30$

B. $y = 2.33x + 30$

C. $y = 2.33x + 51$

D. $y = -2.33x + 2002$

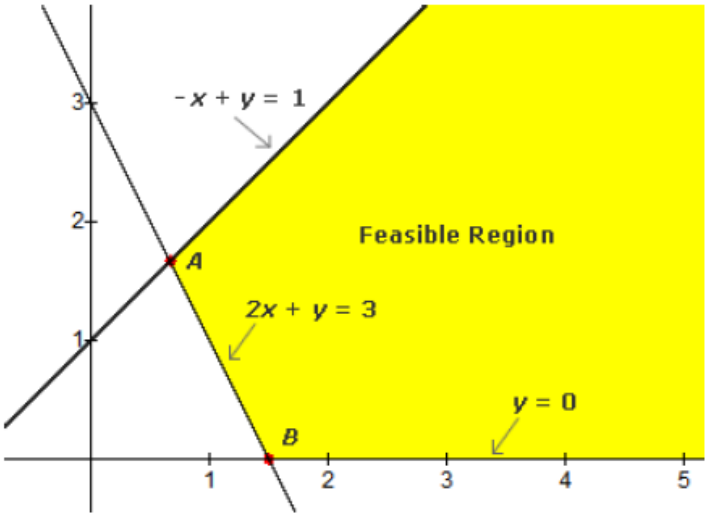
(b) Use the equation from part (a) to predict the amount (in \$ billions) Americans will spend on their pets in the year 2027. *Round answer to nearest tenth of a billion dollars*. **Show work.**

(c) Fill in the blanks to interpret the slope of the equation: The rate of change of pet expenditure with respect to time is _____billion dollars per _____. (Include units of measurement.)

20. Solve the system of equations using elimination by addition, substitution, or augmented matrix methods (your choice). **Show work.**

$$3x + 5y = 1$$
$$x + 3y = 3$$

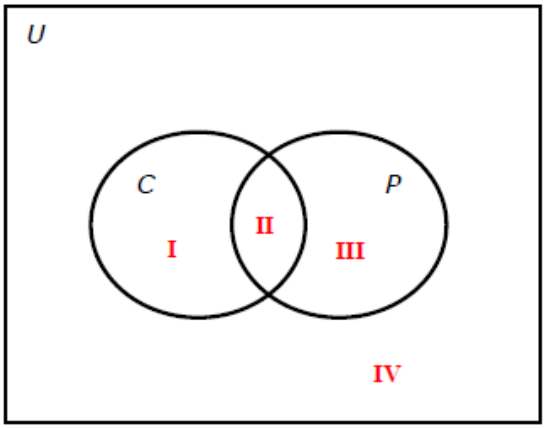
21. The feasible region shown below is bounded by lines $-x + y = 1$, $2x + y = 3$, and $y = 0$. Find the coordinates of corner point A. **Show work.**



22. 42 people attended a holiday event. 24 of the attendees ate a piece of cake. 16 of the attendees ate a piece of pie. 30 of the attendees ate a piece of cake or a piece of pie (or both).

(a) How many of the attendees ate both a piece of cake and a piece of pie? **Show work.**

(b) Let C = {attendees eating a piece of cake} and P = {attendees eating a piece of pie}. Determine the number of attendees belonging to each of the regions I, II, III, IV.



23. A psychologist studied the number of words spoken by a sample of 7 two-year-olds. The numbers of words recorded per each 2-year-old were 20, 19, 30, 22, 50, 36, and 19.

(a) State the mode.

(b) Find the median. **Show work/explanation.**

(c) State the mean.

(d) The sample standard deviation is 11.6. What percentage of the data fall within one standard deviation of the mean? **Show work/explanation.**

(d) _____

A. 34%
B. 57%
C. 68%
D. 86%

24. If the probability distribution for the random variable X is given in the table, what is the expected value of X? **Show work.**

x_i	– 30	10	20	60
p_i	0.30	0.30	0.25	0.15

25. According to a recent report, 0.10 is the probability that an American can identify Janet Yellen as the Chair of the Federal Reserve Board of the US Government. Seven Americans are randomly selected. Find the probability that exactly 3 of the 7 Americans selected can identify Ms Yellen as the Chair of the Federal Reserve Board. *Round answer to the nearest thousandth (three places after decimal).* **Show work.**