MAT 1190 Final Exam Review Problems[1]

1. A project on Kickstarter for an iPad stylus raised $1,253\%$ of their goal, raising a total of $\$313,490$ from $7,511$ supporters. What was their original goal? Round your answer to the nearest cent.

2. The population of a town increased from $3,250$ in 2008 to $4,300$ in 2010. Find the absolute and relative (percent) increase. Round answer to the nearest hundredth of a percent.

3. The number of CDs sold in 2010 was 114 million, down from 147 million the previous year. Find the absolute and relative (percent) decrease. Round answer to the nearest tenth of a percent.

4. A car is driving at 100 kilometers per hour. How far, in meters, does it travel in 2 seconds? Round answer to the nearest meter.

5. A chain weighs 10 pounds per foot. How many ounces will 4 inches weigh? Round answer to the nearest tenth.

6. You want to put a $2''$ thick layer of topsoil for a new $20' \times 30'$ garden. The dirt store sells by the cubic yards. How many cubic yards will you need to order?

7. The sales tax rate in a city is 9.3%. How much sales tax will you pay on a $\$140$ purchase?

8. Diseases tend to spread according to the exponential growth model. In the early days of AIDS, the growth rate was around 190%. In 1983, about 1700 people in the U.S. died of AIDS. If the trend had continued unchecked, how many people would have died from AIDS in 2005?

9. Suppose you obtain a $\$3,000$ T-note with a 3% annual rate, paid quarterly, with maturity in 5 years. How much interest will you earn? Round your answer to the nearest cent.

10. You deposit $\$10,000$ in an account earning 4% annual interest rate compounded monthly.

    (a) How much will you have in the account in 25 years?
    (b) How much interest will you earn?

11. Giving a test to a group of students, the grades and gender are summarized below.

	A	B	C	Total
Male	8	18	13	39
Female	10	4	12	26
Total	18	22	25	65

    (a) If one student was chosen at random, find the probability that the student was female.
    (b) What is the probability that a student chosen at random did not earn a C?

12. A math class consists of 25 students, 14 female and 11 male. Two students are selected at random to participate in a probability experiment. Compute the probability that

    (a) a male is selected, then a female.
   (b) a female is selected, then a male.

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[1] Prepared by Professors Benakli, Rojas, Taraporevala in Fall 2021.

(c) two males are selected.

(d) two females are selected.

13. A boy owns 2 pairs of pants, 3 shirts, 8 ties, and 2 jackets. How many different outfits can he wear to school if he must wear one of each item?

14. How many three-letter "words" can be made from 4 letters "FGHI" if

   (a) repetition of letters is allowed.

   (b) repetition of letters is not allowed.

15. At a baby shower 17 guests are in attendance and 5 of them are randomly selected to receive a door prize. If all 5 prizes are identical, in how many ways can the prizes be awarded?

16. A jury pool consists of 30 people, 16 men and 14 women. Compute the probability that a randomly selected jury of 12 people is all male.

17. A bag contains 3 gold marbles, 10 silver marbles, and 21 black marbles. Someone offers to play this game: You randomly select on marble from the bag. If it is gold, you win $3. If it is silver, you win $2. If it is black, you lose $1. What is your expected value if you play this game?

18. Kori categorized her spending for this month into four categories: Rent, Food, Fun, and Other. The percents she spent in each category are pictured here. If she spent a total of $2,600 this month, how much did she spend on rent?
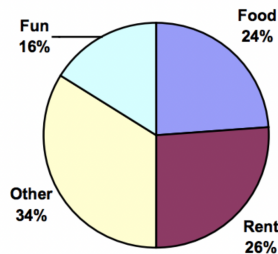
19. You recorded the time in seconds it took for 8 participants to solve a puzzle. The times were: 15.2, 18.8, 19.3, 19.7, 20.2, 21.8, 22.1, 29.4.

   (a) Find the mean.

   (b) Find the median.

   (c) Find the (population) standard deviation of this data.

20. In 2005, $1,475,623$ students heading to college took the SAT. The distribution of scores in the math section of the SAT follows a normal distribution with mean $\mu = 520$ and standard deviation $\sigma = 115$.

   (a) Calculate the z-score for an SAT score of 720. Interpret it using a complete sentence.

   (b) What math SAT score is 1.5 standard deviations above the mean? What can you say about this SAT score?

21. The scatter plot below shows how much money was made by an ice cream shop from selling ice cream versus the noon temperature on a given day, for the last 12 days. State whether the diagram shows a positive correlation, a negative correlation, or no correlation and summarize any conclusions that can be drawn from the diagram.
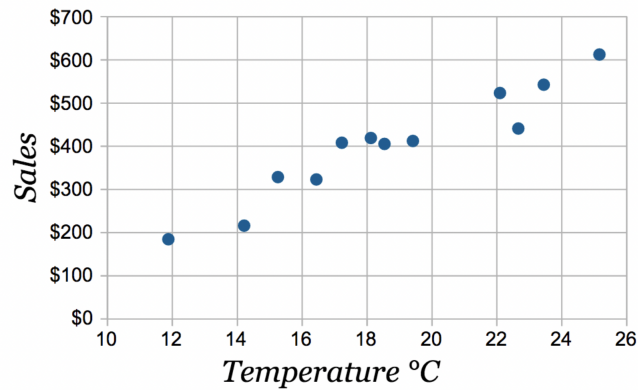
22. If a 12-inch diameter pizza requires 10 ounces of dough, how much dough is needed for a 16-inch pizza?

Answers:

1. $25,019.15

2. The absolute increase of 1050 and relative increase of 32.31%.

3. The absolute decrease is 33 million and the relative percent decrease is 22.45%.

4. 56 meters

5. 53.3 ounces

6. 3.7 cubic yards

7. $13.02

8. $\approx 2.53 \times 10^{13}$ people. Not realistic but mathematically accurate.

9. You will earn $483.55 in interest.

10. **(a)** In 25 years, I will have $27,137.65.
   (b) I will earn $17,137.65 interest.

11. **(a)** $\dfrac{26}{65} = 0.4$
   (b) $\dfrac{40}{65} = 0.6153846154$

12. **(a)** 0.2567
   (b) 0.2567
   (c) 0.1833
   (d) 0.3033

13. The boy owns 96 outfits.

14. **(a)** If repetition is allowed, there are 64 different ways.
   (b) If repetition is not allowed, there are 24 different ways.

15. 6,188 ways

16. 0.00002104

17. 0.24

18. $676

19. **(a)** mean $= 20.8125$

    (b) median $= 19.95$

    (c) population standard deviation $= 3.805074736 \approx 3.81$

20. **(a)** 1.74. The score 720 is 1.74 standard deviations above from the mean value.

    (b) 692.5. So 692.5 is 1.5 standard deviations above the mean.

21. Positive correlation. When the noon temperature goes up, the ice cream shop makes more money.

22. 17.8 ounces