

NO CREDIT WILL BE GIVEN FOR ANY PROBLEM FOR WHICH NO WORK IS SHOWN-EVEN IF THE ANSWER IS CORRECT

42	42	28	25	38
34	38	38	37	43
26	36	29	33	32

Stem	Leaves

Ans 1b $\bar{X} =$ _____

Ans 1c median = _____

Ans 1d $s =$ _____

FINAL EXAM

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2. Events A and B are independent with $P(A) = .17$ and $P(B) = .54$. Find $P(A \cup B)$.

Ans 2 _____

3. Events A and B are mutually exclusive with $P(A) = .41$ and $P(B) = .22$. Find $P(A|B)$.

Ans 3 _____

4. A patient complaining of severe stomach pains checked into a local hospital. After a series of tests, the doctors narrowed the diagnosis to four possible ailments. The ailments, the cost for treatment, and the probability of having each ailment are summarized in the following probability distribution:

Ailment	Cost	Probability
Hepatitis	\$17,200	.32
Cirrhosis	\$14,350	.16
Gallstones	\$29,650	.36
Pancreatic Cancer	\$83,900	.16

What is the expected cost of treatment for this patient?

Ans 4 _____

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5. In tossing a fair coin 16 times, what is the probability of getting at most 3 tails?

Ans 5 _____

6. Draw a **single card** from an ordinary deck of 52. Find each of the following: (Leave your answer as a reduced fraction-no decimals)

a. $P(6 \text{ or red})$

Ans 6a _____

b. $P(\text{black or } \heartsuit)$

Ans 6b _____

c. $P(5 \text{ and J})$

Ans 6c _____

7. Use the standard normal distribution to find each of the following. Be sure to include a sketch of the curve as part of your answer.

a. $P(-3.01 \leq Z < -.78)$

Ans 7a _____

b. $P(Z \geq -2.94)$

Ans 7b _____

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8. X is a binomial r.v. with $n = 800$ and $p = .36$.
- a. Use the standard normal distribution to approximate:
 $P(266 \leq X \leq 321)$

Ans 8a _____

- b. What allows us to use the standard normal distribution to approximate binomial probabilities when n is large?

Ans 8b _____

9. The length X of commercials is normally distributed with a mean of 58.2 seconds and a standard deviation of 1.6 seconds. What is the probability a commercial will last longer than 62.39 seconds?

Ans 9 _____

10. The manager of a large supermarket took a random sample of 2000 egg cartons and found that 160 cartons had at least one broken egg.
- a. Find a point estimate for the proportion of **all** egg cartons that have at least one broken egg.

Ans 10a _____

- b. Estimate this proportion using 92% C.I.

Ans 10b _____

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11. It is known that white sharks grow to a mean length of 18.2 feet. A marine biologist claims that the great white sharks off the coast of Bermuda grow much longer. Sixteen great white sharks are captured, measured, and released off of Bermuda's coast. The mean length is 19 feet and the standard deviation is 3.1 feet. Does the data provide sufficient evidence at the .05 level of significance to support the biologist's claim?

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12. A university uses an old brand of fluorescent bulb. A manufacturer of a new brand of bulb claims that its new bulb has a longer mean life than the old bulb. The university will switch to this new brand of bulb if it is convinced at the .10 level of significance of the manufacturer's claim. The sample size, sample mean life, and standard deviation for the old and new bulbs are summarized in the table. Will the university switch to the new bulb? (Let μ_1 = the mean life of the old brand and μ_2 = the mean life of the new brand)

Old brand	New brand
$n_1 = 180$	$n_2 = 200$
$\bar{x}_1 = 1200$	$\bar{x}_2 = 1246.8$
$s_1 = 185$	$s_2 = 170$

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13. In a manufacturing plant, a manager wishes to see if, for any given day, there is a relationship between the number of workers absent from the assembly line and the number of defective products coming off of the line for that day. The number of workers absent and the number of defects have been recorded for 5 randomly selected days as summarized in the table:

# absent from the assembly line	10	8	4	7	5
# defective products coming off of the line	24	16	7	13	10

- a. Which is the explanatory variable, x ?

Which is the response variable, y ?

- b. Using the calculator's capabilities, find the equation that best fits this data. Write the answer in $\hat{y} = ax + b$ form.

Ans 13 b _____

- c. Use your equation to approximate the number of defective products for a day where 6 workers are absent from the assembly line.

Ans 13 c _____

- e. Give the value of the correlation coefficient, r and interpret its meaning in the context of this problem. $r =$ _____

- f. Give the value of the coefficient of determination, r^2 and interpret its meaning in the context of this problem. $r^2 =$ _____