Math 1001 Final Exam Practice Problems

1

Consider a population that grows according to the recursive rule $P_n = P_{n-1} + 125$, with initial population $P_0 = 20$.

Then:

$P_1 = $ [_____]

$P_2 = $ [_____]

Find an explicit formula for the population. Your formula should involve n (use lowercase n)

$P_n = $ [_____] [Preview]

Use your explicit formula to find P_{100}

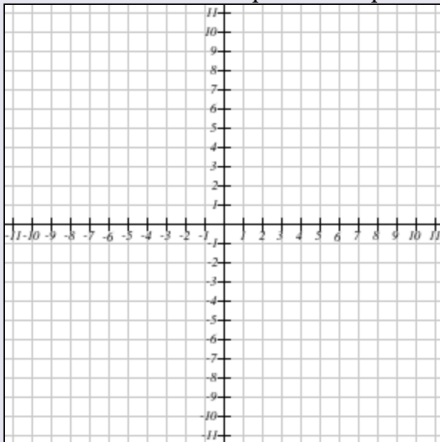$P_{100} = $ [_____]

Get help: [Video]

[Show Answer] 145

[Show Answer] 270

[Show Answer] $20 + n \cdot 125$

[Show Answer] 12520

2 Find the equation for the **linear function** that passes through the points $(-4, -4)$ and $(4, 2)$. Answers must use whole numbers and/or fractions, not decimals.
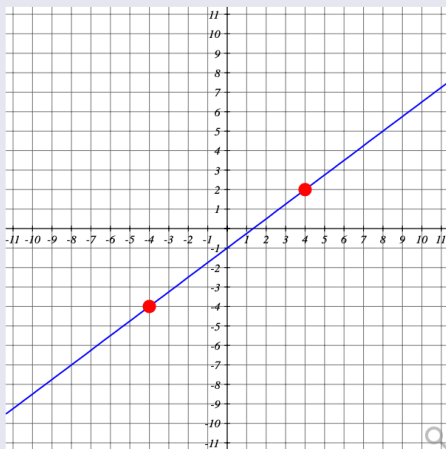
    a. Use the line tool below to plot the two points.

        [Clear All] Draw: [✏]

    b. State the slope between the points as a reduced fraction. [＿＿＿＿] [Preview]

    c. State the y-intercept of the linear **function**. [＿＿＿＿]

    d. State the linear function. [＿＿＿＿] [Preview]

Get help: [Video]

[Show Answer]

[Show Answer] $\dfrac{3}{4}$

[Show Answer] $(0, -1)$

[Show Answer] $f(x) = \dfrac{3}{4}x - 1$

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3 Carl has already stuffed 12 envelopes, and will continue to stuff 7 envelopes per minute. Find a linear function E that represents the total number of envelopes Carl will have stuffed in t minutes, assuming he doesn't take any breaks.

$E(t) =$ [＿＿＿＿] [Preview]

[Show Answer] $7 \cdot t + 12$

4 Determine the vertex of the quadratic function $y = x^2 - 6x + 27$:

○ (6,27)

○ (3,18)

○ (3,27)

○ (3,54)

○ (6,18)

Show Answer (3,18)

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5 The crime rate of a certain city is increasing by exactly 2 % each year. If there were 550 crimes in the year 1990 and the crime rate remains constant each year, determine the approximate number of crimes in the year 2022.

Round to the nearest whole number.

[   ] Preview

Show Answer 1036

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6 A political scientist surveys 32 of the current 112 representatives in a state's congress.

What is the size of the sample: [   ]

What is the size of the population: [   ]

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Show Answer 32

Show Answer 112

The table below shows scores on a Math test

90	70	80	90
80	80	50	100
50	100	60	100
100	30	90	100
80	90	50	90
70	80	80	70

Complete the frequency table for the Math test scores

Score	Frequency
30	
40	
50	
60	
70	
80	
90	
100	

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Show Answer 1,0,3,1,3,6,5,5

8 Kara categorized her spending for this month into four categories: Rent, Food, Fun, and Other. The amounts she spent in each category are pictured here.

| Food $222 | Rent $278 |
| Other $333 | Fun $167 |
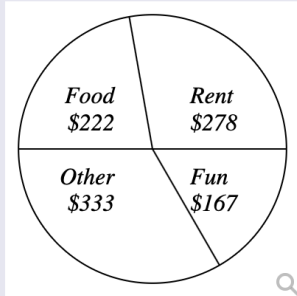
What percent of her total spending did she spend on Fun? Answer to the nearest whole percent.

[   ] %

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Show Answer   17

9

Find the 5 number summary for the data shown below.

15	70
77	43
39	42
20	78
37	83

5 number summary:

[   ] , [   ] , [   ] , [   ] , [   ]
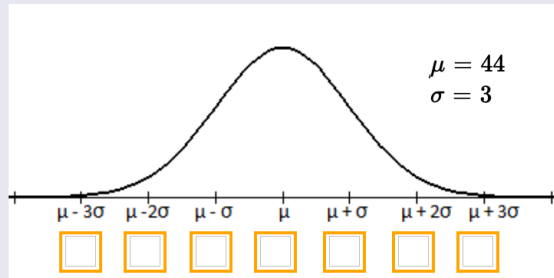
Get help: Video Video Video Video

Show Answer   15,37,42.5,77,83

10 The time to complete an exam is approximately Normal with a mean $\mu = 44$ minutes and a standard deviation $\sigma = 3$ minutes.

The bell curve below represents the distribution for testing times. The scale on the horizontal axis is equal to the standard deviation. Fill in the indicated boxes.

$\mu = 44$
$\sigma = 3$

$\mu - 3\sigma$ $\mu - 2\sigma$ $\mu - \sigma$ μ $\mu + \sigma$ $\mu + 2\sigma$ $\mu + 3\sigma$

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Show Answer 35
Show Answer 38
Show Answer 41
Show Answer 44
Show Answer 47
Show Answer 50
Show Answer 53

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11 A group of people were asked if they had run a red light in the last year. 397 responded "yes", and 117 responded "no".

Find the probability that if a person is chosen at random, they responded "yes".

Answer: [ ]

Give your answer as a decimal, rounded to the nearest thousandth.

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Show Answer 0.772

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

	A	B	C	Total
Male	4	3	11	18
Female	6	2	18	26
Total	10	5	29	44

If one student is chosen at random, find the probability that the student did NOT get an "C". Give your answer as a reduced fraction.

P(student did NOT get an "C") = [ ] Preview

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Show Answer $\dfrac{15}{44}$

13 A company estimates that 0.1% of their products will fail after the original warranty period but within 2 years of the purchase, with a replacement cost of $200.

If they offer a 2 year extended warranty for $18, what is the company's expected value of each warranty sold?

$ [   ]   Preview

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Show Answer   17.8

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14 Sara draws the 3 of hearts from a standard deck of 52 cards. Without replacing the first card, she then proceeds to draw a second card.

a. Determine the probability that the second card is another 3.

$P(3 \mid 3 \text{ of hearts}) =$ [   ]   Preview

b. Determine the probability that the second card is another heart.

$P(\text{heart} \mid 3 \text{ of hearts}) =$ [   ]   Preview

c. Determine the probability that the second card is a club.

$P(\text{club} \mid 3 \text{ of hearts}) =$ [   ]   Preview

d. Determine the probability that the second card is a 6.

$P(6 \mid 3 \text{ of hearts}) =$ [   ]   Preview

Write your answers as reduced fractions.

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Show Answer $\dfrac{1}{17}$

Show Answer $\dfrac{4}{17}$

Show Answer $\dfrac{13}{51}$

Show Answer $\dfrac{4}{51}$

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15 Juan owns 2 pairs of pants, 8 shirts, 7 ties, and 7 jackets. How many different outfits can he wear to school if he must wear one of each item?

He can wear [   ] different outfits.

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Show Answer   784

Let the Universal set be the letters a through j: U = {a, b, ..., i, j}.

Let A = {a, e, f, i}, B = {a, c, d, i}, and C = {c, f, i, j}

List the elements of the set $(A \cap B) \cup C$

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Show Answer   a, c, f, i, j

Complete the truth table for the statement ~Q ∧ ~P.

Q	P	~Q ∧ ~P
T	T	?
T	F	?
F	T	?
F	F	?

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Show Answer   F

Show Answer   F

Show Answer   F

Show Answer   T

18 Complete the truth table for the following compound statement.

$$\sim p \rightarrow \sim q$$

p	q	~p	~q	~p → ~q
T	T	? ↕	? ↕	? ↕
T	F	? ↕	? ↕	? ↕
F	T	? ↕	? ↕	? ↕
F	F	? ↕	? ↕	? ↕

Complete the truth table for the following compound statement.

$$q \leftrightarrow \sim p$$

p	q	~p	q ↔ ~p
T	T	? ↕	? ↕
T	F	? ↕	? ↕
F	T	? ↕	? ↕
F	F	? ↕	? ↕

Show Answer

p	q	~p	~q	~p → ~q
T	T	F	F	T
T	F	F	T	T
F	T	T	F	F
F	F	T	T	T

p	q	~p	q ↔ ~p
T	T	F	F
T	F	F	T
F	T	T	T
F	F	T	F

19

Determine if the conclusion follows logically from the premises.

Premise: Squares have four sides
Premise: My yard has four sides
Conclusion: My yard has the shape of a square

○ Valid argument

○ Invalid argument

Show Answer   Invalid argument

20   Determine whether the following argument is inductive or deductive:

"The last mayor was honest. The current mayor is honest. All mayors are honest."

This argument is   Select an answer ⬍
Show Answer   inductive