Use the sample of Test Scores to answer the following questions to determine the z-score and grade for the test scores:

29) 83

30) 143

30 ✓

Answer Sheet

1	0.07	16	0.171
2	0.31	17 *	0.658
3	0	18	0.014
4	0.93	19	0.071
5	0.54	20	0.045
6	0.26	21	0.381
7	0.16	22	0.284
8	0.74	23	95
9	0.854	24	100
10	0.568	25	120
11	0.237	26	60
12	0.273	27	137.5
13	0.632	28	108
14	male	29	-0.61
15	female	30	1.62

East Los Angeles College
Department of Mathematics
Math 227
Test 2

Show work for credit and approximate all answers to the nearest ten thousandths where applicable.

Computer Purchases- Of 500 purchases made at ELAC 345 were desktop computers, 120 were laptop computers, and 35 were printers. As part of an audit, a purchase order was selected at random. What's the probability that the purchase order was:

1) A printer?
2) A non-desktop?
3) Laptop and a desktop?
4) Laptop or a desktop?

Statistics Grades- In a statistics class of 50 students. There were 23 men and 27 women. 5 of the men and 8 of the women received an A in the course. If a student is chosen at random, that's the probability the student:

5) Was women?
6) Received an A?
7) The student was a woman who received an A?
8) The student did not receive an A?

Gender and Pet Preference- Does gender affect the type of pet you own? The following table lists the results.

Gender	Cats	Dogs	Other	Total
Female	120	45	25	190
Male	60	125	35	220
Total	180	170	60	410

If you select a person at random, that's the probability the person:

9) Prefers a cat or a dog?
10) Prefers a dog given that the person is a male?
11) Prefers a dog given that the person is a female?
12) Prefers a cat given that the person is a male?
13) Prefers a cat given that the person is a female?
14) Which gender prefers a dog?
15) Which gender prefers a cat?
16) If two different people are selected at random, what's the probability they are both prefer a dog?
17) If two different females are selected at random, what's the probability at least one prefers a dog?

HIV Testing- The ELISA test is used to screen blood presence of HIV. The following table illustrates a sample of results.

Results	Infected	Not Infected	Total
Positive	650	50	700
Negative	35	2480	2515
Total	685	2530	3215

If a person is selected at random, what's the probability the person?

18) Is infected given that the person tests negative?

19) Is not infected given that the person tests positive?

20) If two different people are selected at random, what's the probability they are both infected?

21) If two different people are selected at random, what's the probability at least one is infected?

Water Sampling- 8% of household water is contaminated with excessive fluoride.

22) If water samples are collected from 4 households and mixed in an effort to save revenue, what's the probability a mixture will test positive for fluoride?

Use the sample of Test Scores to answer the following questions.

Test Scores	Locator	Sorted Test Scores
58	1	45
120	2	58
100	3	60
85	4	60
60	5	60
45	6	83
83	7	85
100	8	85
108	9	85
100	10	88
90	11	90
150	12	90
88	13	90
140	14	100
135	15	100
120	16	100
118	17	100
85	18	105
60	19	108
150	20	108
120	21	110
100	22	118
90	23	120
85	24	120
105	25	120
60	26	120
120	27	135
90	28	140
108	29	150
110	30	150

Mean 99.43
SD 26.90

23) Determine the 1st Quartile.
24) Determine the 2nd Quartile.
25) Determine the 3rd Quartile.
26) Determine the 1st Decile.
27) Determine the 9th Decile.
28) Determine the 65th percentile.

math 227 Test 2 Solutions

① 345 Desktop
120 laptop
35 printers
500

$$P(\text{print}) = \frac{n(\text{print})}{n(S)} = \frac{35}{500} \approx \boxed{0.07}$$

② $P(\text{non Desk}) = 1 - P(\text{Desk})$

$$= 1 - \frac{345}{500} \approx \boxed{0.31}$$

$=$

③ $P(\text{lap and Desktop}) = \frac{n(\text{lap and Desk})}{n(S)}$

$$= \frac{0}{500} = \boxed{0}$$

④ $P(\text{lap or Desk}) = P(\text{lap}) + P(\text{Desk}) - P(\text{Both})$

$$= \frac{120}{500} + \frac{345}{500} - 0$$

$$= \frac{465}{500} \approx \boxed{0.93}$$

⑤

	A	non A	
men	5	18	23
women	8	19	27
	13	37	(50)

(5) $P(w) = \frac{n(w)}{n(S)}$; $P(w) = \frac{27}{50} \approx \boxed{0.54}$

(6) $P(A) = \frac{n(A)}{n(S)}$; $P(A) = \frac{13}{50} \approx \boxed{0.26}$

(7) $P(w \text{ and } A) = \frac{n(w \text{ and } A)}{n(S)} \approx \frac{8}{50} \approx \boxed{0.16}$

(8) $P(\text{non } A) = 1 - P(A)$

$= 1 - \frac{13}{50} \approx \boxed{0.74}$

(9) $P(\text{Cat or Dog}) = P(C) + P(D) - P(\text{Both})$

$= \frac{160}{410} + \frac{170}{410} - 0$

$= \frac{350}{410} \approx \boxed{0.854}$

(10) $P(\text{Dog} \mid m) = \frac{n(D \text{ and } m)}{n(m)}$

$= \frac{125}{220} \approx \boxed{0.568}$

(11) $P(\text{Dog} \mid f) = \frac{n(D \text{ and } f)}{n(f)}$

$= \frac{45}{190} \approx \boxed{0.237}$

(12) $P(\text{cat} \mid \text{male}) = \frac{P(C \text{ and } M)}{n(m)}$

$= \frac{60}{220} \approx \boxed{0.273}$

(13) $P(\text{cat} \mid f) = \frac{n(\text{cat and } f)}{n(f)}$

$= \frac{120}{190} \approx \boxed{0.632}$

(14) male (15) female

(16) $P(\text{Both Dog}) = P(\text{1st D and 2nd D})$

$= P(\text{1st D}) \cdot P(\text{2nd D})$

$= \frac{170}{410} \cdot \frac{169}{409}$

$\approx \boxed{0.171}$

(17) P(at least one prefers dog)

$= 1 - P(\text{none})$

"no ~~females~~ prefer dog

(17) p(at least one person prefers dog)

$= 1 - p(\text{none prefer dog})$

$= 1 - p(\text{1st non dog and 2nd non dog})$

$= 1 - p(\text{1st non dog}) \cdot p(\text{2nd non dog})$

$= 1 - \frac{240}{410} \cdot \frac{239}{409} \approx \boxed{0.658}$

(18) $p(\text{inf} \mid \text{test}-) = \frac{n(\text{inf and test}-)}{n(\text{test}-)}$

$= \frac{35}{2515} \approx \boxed{0.014}$

(19) $p(\text{not inf} \mid \text{test}+) = \frac{n(\text{not inf and test}+)}{n(\text{test}+)}$

$= \frac{50}{700} \approx \boxed{0.071}$

(20) p(Both are inf)

$= p(\text{1st inf and 2nd inf}) = p(\text{1st inf}) \cdot p(\text{2nd inf})$

$= \frac{685}{3215} \cdot \frac{684}{3214} \approx \boxed{0.045}$

(21) p(at least one inf)

$= 1 - p(\text{none inf})$

$= 1 - p(\text{1st not inf}) \cdot p(\text{2nd not inf})$

$= 1 - \frac{2530}{3215} \cdot \frac{2529}{3214} \approx \boxed{0.381}$

(22) $p(\text{flouride} \mid \text{test +}) = 0.08$

mixture will test + when at least one house hold test + for flouride

$p(\text{at least one test +}) = 1 - p(\text{none test +})$

$= 1 - p(\text{1st not test +}) \cdot p(\text{2nd not test +}) \cdot p(\text{3rd not test +}) \cdot p(\text{4th not test +})$

$= 1 - 0.92 \cdot 0.92 \cdot 0.92 \cdot 0.92$

$1 - 0.92^4 \approx \boxed{0.284}$

(23) $Q_1 = P_{25}$

$L = \frac{25}{100} \cdot 30 \approx 7.5 \approx 8$

$\boxed{Q_1 = 85}$

(24) $Q_2 = P_{50} = 100$

$L = \frac{50}{100} \cdot 30 = 15$

$Q_2 = \frac{100 + 100}{2} = 100$

$\boxed{Q_2 = 100}$

(25) $Q_3 = P_{75} = 120$

$L = \frac{75}{100} \cdot 30 = \frac{3}{4} \cdot 30 = 22.5 \simeq 23$

$\boxed{Q_3 = 120}$

(26) $P_1 = P_{10}$ $\therefore$ $\boxed{D_1 = 60}$

$L = \frac{10}{100} \cdot 30 = 3$

$P_{10} = \frac{60 + 60}{2} = 60$

(27) $D_9 = P_{90}$ $\boxed{D_9 = 137.5}$

$L = \frac{90}{100} \cdot 30 = 27$

$D_9 = \frac{135 + 140}{2}$ 137.5

(28) P_{65}

$$L = \frac{65}{100} \cdot 30 = 19.5 \approx 20$$

$$\boxed{P_{65} = 108}$$

(29) $$z = \frac{x - 99.43}{26.9}$$

$$z = \frac{83 - 99.43}{26.9} \approx -0.61$$

$$\boxed{z \approx -0.61}$$

(30) $$z = \frac{143 - 99.43}{26.9} \approx 1.62$$

$$\boxed{z \simeq 1.62}$$