Math 14 Name_____

Practice Questions for Final Exam

In a survey of 20 teenagers who text, the following data were obtained. Each value represents the number of texts sent by each teen per day.

$28 \div 6 \approx 4.7 \rightarrow 5$

2	8	6	14	22	29	14	13	12	15
13	30	19	6	9	15	8	11	16	11

Complete the following frequency distribution with 6 classes. Use the data set and/or the table to answer questions #1 – 10.

Class limits	Class boundaries	Tally	Frequency	Relative Frequency
2 – 6	1.5 – 6.5	xxx	3	3÷20 = .15
7 – 11	6.5 – 11.5	xxxxx	5	5÷20 = .25
12 – 16	11.5 – 16.5	xxxxxxxx	8	8÷20 = **.40**
17 – 21	16.5 – 21.5	x	1	1÷20 = .05
22 – 26	21.5 – 26.5	x	**1**	1÷20 = .05
27 – 31	26.5 – 31.5	x	2	1÷20 = .10

1. The class limits of the 6th class are
(a) 22 – 26 **(b)** 27 – 31 **(c)** 26 – 30 **(d)** 25 – 32

2. The frequency of the 5th class is
(a) 1 **(b)** 2 **(c)** 3 **(d)** 4

3. The relative frequency of the 3rd class is
(a) 0.5 **(b)** 0.15 **(c)** 0.25 **(d)** 0.40

4. The median of the data set is
(a) 11 **(b)** 12 **(c)** 13 **(d)** 14

5. The Q_3 of the data set is
(a) 15 **(b)** 15.5 **(c)** 16 **(d)** 16.5

6. The mean of the data set is
(a) 12 **(b)** 12.65 **(c)** 13 **(d)** 13.65

7. The class with limits of 7 – 11 would have a sector in a pie graph of how many degrees?
(a) 25º **(b)** 90º **(c)** 100º **(d)** 120º

8. What data value marks the 45th percentile of the data set? Use the formula $c = \frac{n \bullet p}{100}$
(a) 9 **(b)** 10 **(c)** 11 **(d)** 12

9. The data type of the number of texts sent by each teen each day is
(a) continuous **(b)** discrete **(c)** qualitative **(d)** none of these

10. The data measurement level of the number of texts sent by each teen each day is
(a) nominal **(b)** ordinal **(c)** interval **(d)** ratio

1	2
2	6
3	6
4	8
5	8
6	9
7	11
8	11
9	12
10	13
11	13
12	14
13	14
14	15
15	15
16	16
17	19
18	22
19	29
20	30

In a survey of 20 teenagers who text, the following data were obtained. Each value represents the number of texts sent by each teen per day. (This is the same data set as the set on the first page.)

2	8	6	14	22	29	14	13	12	15
13	30	19	6	9	15	8	11	16	11

Construct a stem and leaf plot for the data above. Use the data set and/or the table to answer questions #11 – 13.

Stem	Leaves
0	2 6 6 8 8 9
1	1 1 2 3 3 4 4 5 5 6 9
2	2 9
3	0

11. The "leaf" numbers for this data are the digits in the

(a) hundreds place **(b)** tens place **(c)** ones place **(d)** hundredths place

12. The "leaf" number in the 4th row of the stem and leaf plot is

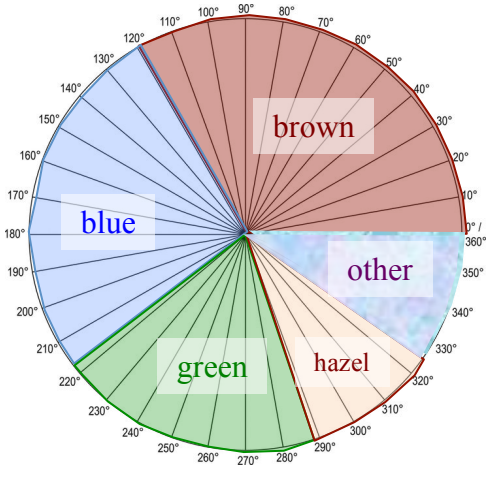
(a) 0 **(b)** 1 **(c)** 2 **(d)** 3

13. To obtain the above data, 5 teens were randomly chosen from a freshman class, 5 from a sophomore class, 5 from a junior class, and 5 from a senior class. This kind of sampling is called

(a) random **(b)** systematic **(c)** stratified **(d)** cluster

The results of a survey of the eye colors of 30 students are given. Use this data to construct a pie graph.

Eye Color	Freq.	Rel. Freq.	Angle
Brown	10	$\frac{10}{30}=\frac{1}{3}$	$\frac{1}{3}\cdot 360 = 120^\circ$
Blue	8	$\frac{8}{30}=\frac{4}{15}$	$\frac{4}{15}\cdot 360 = 96^\circ$
Green	6	$\frac{6}{30}=\frac{1}{5}$	$\frac{1}{5}\cdot 360 = 72^\circ$
Hazel	3	$\frac{3}{30}=\frac{1}{10}$	$\frac{1}{10}\cdot 360 = 36^\circ$
Other	3	$\frac{3}{30}=\frac{1}{10}$	$\frac{1}{10}\cdot 360 = 36^\circ$



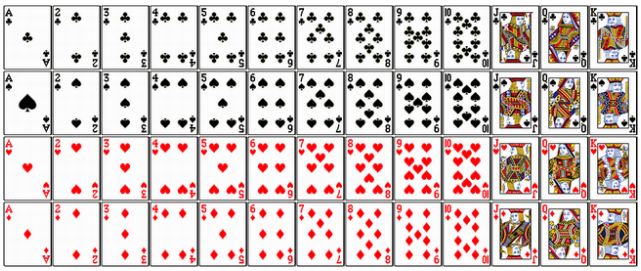
14. The angle of the sector representing the number of students with hazel eyes is

(a) 36 **(b)** 72 **(c)** 90 **(d)** 120

15. The data measurement level of eye color is

(a) nominal **(b)** ordinal **(c)** interval **(d)** ratio

A single card will be drawn from a 52-card deck.



A = the card drawn is a heart
B = the card drawn is an even numbered card
C = the card drawn is a club
D = the card drawn is a queen

16. $P(A \text{ or } B) =$

(a) $\frac{21}{52}$ **(b)** $\frac{28}{52}$ **(c)** $\frac{25}{52}$ **(d)** $\frac{23}{52}$

17. $P(D \mid A) =$

(a) $\frac{1}{13}$ **(b)** $\frac{23}{52}$ **(c)** $\frac{2}{13}$ **(d)** $\frac{21}{52}$

For #18 – 20, two cards will be drawn from a 52-card deck ***with*** replacement.
Subscripts will be used to represent the first and second draws.

18. $P(A_1 \text{ and } C_2) =$

(a) $\frac{1}{4}$ **(b)** $\frac{1}{8}$ **(c)** $\frac{1}{16}$ **(d)** $\frac{1}{32}$

19. $P(D_2 \mid D_1) =$

(a) $\frac{4}{13}$ **(b)** $\frac{2}{13}$ **(c)** $\frac{3}{13}$ **(d)** $\frac{1}{13}$

20. When two cards are drawn with replacement, are the events D_2 and D_1 independent?

(a) Yes **(b)** No **(c)** Sometimes **(d)** Can't determine

For #21 – 23, two cards will be drawn from a 52-card deck ***without*** replacement.

21. $P(A_1 \text{ and } C_2) =$

(a) $\frac{1}{4}$ **(b)** $\frac{13}{51}$ **(c)** $\frac{13}{204}$ **(d)** $\frac{17}{204}$

22. $P(D_2 \mid D_1) =$

(a) $\frac{1}{17}$ **(b)** $\frac{1}{18}$ **(c)** $\frac{1}{19}$ **(d)** $\frac{1}{20}$

23. When two cards are drawn without replacement, are the events D_2 and D_1 independent?

(a) Yes **(b)** No **(c)** Sometimes **(d)** Can't determine

24. If ${}_nP_r = \dfrac{n!}{(n-r)!}$, find ${}_6P_4$. $\dfrac{6!}{(6-4)!} = \dfrac{6\cdot5\cdot4\cdot3\cdot2!}{2!} = 6\cdot5\cdot4\cdot3 = 360$

(a) 30 **(b)** 50 **(c)** 100 **(d)** 360

25. If ${}_nC_r = \dfrac{n!}{(n-r)!r!}$, find ${}_6C_4$. $\dfrac{6!}{(6-4)!4!} = \dfrac{6\cdot5\cdot4!}{2!\cdot4!} = 3\cdot5 = 15$

(a) 6 **(b)** 15 **(c)** 10 **(d)** 60

26. How many 4-digit ID numbers can be formed using the digits 1, 2, 3, and 4 (repeats are allowed). $4\cdot4\cdot4\cdot4 = 256$

(a) 256 **(b)** 128 **(c)** 64 **(d)** 16

27. How many ways can 6 books be arranged on a shelf? $6\cdot5\cdot4\cdot3\cdot2\cdot1 = 720$

(a) 256 **(b)** 720 **(c)** 24 **(d)** 12

All possible answers to a 4-question quiz with answers of A or B only are listed:

AAAA	AAAB	AABA	AABB	ABAA	ABAB	ABBA	ABBB
BAAA	BAAB	BABA	BABB	BBAA	BBAB	BBBA	BBBB

Use the table above to complete the probability distribution for the number of B's occurring. Write probabilities as fractions.

Number of B's, (X)	$P(X)$	$X\cdot P(X)$	$(X-\mu)^2\cdot P(X)$
0	$\frac{1}{16}$	$0\cdot\frac{1}{16}=0$	$(0-2)^2\cdot\frac{1}{16}=\frac{4}{16}$
1	$\frac{4}{16}$	$1\cdot\frac{1}{16}=\frac{1}{16}$	$(1-2)^2\cdot\frac{4}{16}=\frac{4}{16}$
2	$\frac{6}{16}$	$2\cdot\frac{6}{16}=\frac{12}{16}$	$(2-2)^2\cdot\frac{1}{16}=0$
3	$\frac{4}{16}$	$3\cdot\frac{4}{16}=\frac{12}{16}$	$(3-2)^2\cdot\frac{1}{16}=\frac{4}{16}$
4	$\frac{1}{16}$	$4\cdot\frac{1}{16}=\frac{4}{16}$	$(4-2)^2\cdot\frac{1}{16}=\frac{4}{16}$
		$\mu=\Sigma X\cdot P(X)=\frac{32}{16}=2$	$\sigma^2=\Sigma(X-\mu)^2P(X)=\frac{16}{16}=1$
			$\sigma=\sqrt{\Sigma(X-\mu)^2P(X)}=\sqrt{1}=1$

28. The probability of 3 B's occurring is

(a) 4/16 **(b)** 6/16 **(c)** 8/16 **(d)** 10/16

29. The mean of the distribution is

(a) 0 **(b)** 1/2 **(c)** 1 **(d)** 2

30. The standard deviation of the distribution is

(a) 0 **(b)** 1/2 **(c)** 1 **(d)** 2

One thousand raffle tickets are sold at \$2 each for an Android valued at \$300. What is the expected value of the gain if a person puchases one ticket?

	X (Gain)	$P(X)$	$X \bullet P(X)$
Win	298	$\frac{1}{1000}$	0.298
Lose	–2	$\frac{999}{1000}$	–1.998

24. The expected value of the raffle is –\$1.70

(a) –\$2 **(b)** –\$1.70 **(c)** \$300 **(d)** \$4.50

25. What is the probability that exactly 8 heads will occur in 10 coin tosses? Use the formula $P(X) = {}_nC_X \bullet p^X \bullet q^{n-X} = \frac{n!}{(n-X)!X!} \bullet p^X \bullet q^{n-X}$.

$\frac{10!}{(10-8)!8!} \bullet (.5)^8 \bullet (.5)^{10-8} = 45 \bullet (.5)^8 \bullet (.5)^{10-8} \approx 0.0439$

(a) 0.04 **(b)** 0.44 **(c)** 0.9 **(d)** 1