Sec 3

Name Key ID: 1

Period

Statistics and Probability Test

Find the number of possible outcomes.

1) A math quiz has ten true/false questions.

A) 743 B) 1024

C) 1444 D) 980

2) A jewelry store sells gold and platinum rings. Each ring is available in ten styles and is fitted with one of six gemstones.

A) 110 B) 120

C) 168 D) 142

State if each scenario involves a permutation or a combination.

3) A group of 24 people need to take an elevator to the top floor. They will go in groups of eight. They are deciding who will take the elevator on its second trip.

A) Combination B) Permutation

4) A group of 20 people are going to run a race. The top three runners earn gold, silver, and bronze medals.

A) Permutation B) Combination

Find the number of possible outcomes.

5) Oops! Sadie dropped a deck of cards. Which expression represents the number of ways she can pick up 7 of them.

A) $\frac{52!}{7!}$ B) ${}_{52}P_7$

C) ${}_{52}C_7$ D) $52! \cdot 7!$

6) A gambler places a bet on a horse race. To win, he must pick the top three finishers in order. Nine horses of equal ability are entered in the race. How many ways can they finish in first, second and third place?

A) 792 B) 56

C) 1001 D) 504

Find the probability for the following Independent, Dependent, or Conditional Events.

7) A die is rolled then a letter in the word STATISTICS is randomly selected. What is the probability of rolling a three, then the letter T?

A) $\frac{1}{5}$ B) $\frac{13}{36}$

C) $\frac{3}{20}$ D) $\frac{1}{20}$

8) You flip a coin and then roll a fair six-sided die. The coin lands tails-up and the die shows an odd number.

A) $\frac{24}{121} \approx 0.198$ B) $\frac{5}{18} \approx 0.278$

C) $\frac{1}{4} = 0.25$ D) $\frac{25}{144} \approx 0.174$

9) A card is selected at random from a standard deck of 52 playing cards. What is the probability that it is not a king, queen or jack?

A) $\frac{9}{13}$ B) $\frac{10}{13}$

C) $\frac{3}{13}$ D) $\frac{4}{13}$

10) A card is randomly selected from a standard deck of cards.

p(you get a face card | given it is red)

A) 0 B) $\frac{1}{2}$

C) $\frac{6}{52}$ D) $\frac{3}{13}$

A cooler contains twelve bottles of sports drink: three lemon-lime flavored, four orange flavored, and five fruit-punch flavored.

11) You randomly grab a bottle. Then you RETURN the bottle to the cooler, mix up the bottles, and randomly select another bottle.
P(Both times you get a lemon-lime drink)

A) $\frac{35}{132}$ B) $\frac{30}{121}$

C) $\frac{1}{11}$ D) $\frac{1}{16}$

12) You randomly grab abottle and give it to your friend. Then, you randomly grab a bottle for yourself.
P(Your friend gets a lemon-lime and you get an orange.)

A) $\frac{4}{35}$ B) $\frac{11}{105}$

C) $\frac{1}{11}$ D) $\frac{2}{63}$

Find the binomial probability of each event. ${}_nC_r \cdot p^r q^{n-r}$

13) A fair coin is flipped six times. What is the probability of the coin landing heads up exactly two times?

A) $\frac{15}{64} \approx 23.438\%$

B) $\frac{45}{1024} \approx 4.395\%$

C) $\frac{231}{1024} \approx 22.559\%$

D) $\frac{63}{256} \approx 24.609\%$

14) One day, eleven babies are born at a hospital. Assuming each baby has an equal chance of being a boy or girl, what is the probability that exactly eight of the eleven babies are girls?

A) $\frac{55}{2048} \approx 2.686\%$

B) $\frac{35}{128} \approx 27.344\%$

C) $\frac{165}{2048} \approx 8.057\%$

D) $\frac{5}{16} \approx 31.25\%$

15) A six-sided die is rolled eight times. What is the probability that the die will show an even number at least seven times?

A) $\frac{509}{512} \approx 99.414\%$ B) $\frac{9}{256} \approx 3.516\%$

C) $\frac{1}{2} = 50\%$ D) $\frac{3797}{4096} \approx 92.7\%$

Find each term described.

16) 5th term in expansion of $(y+x)^7$

A) y^3x^4 B) $21y^2x^5$

C) $35y^3x^4$ D) $35y^4x^3$

17) 4th term in expansion of $(u+v)^5$

A) $10u^3v^2$ B) $5uv^4$

C) $10u^2v^3$ D) u^2v^3

Name_____ **Probability and Statistics**

Period_____ Test A

Normal Curve Distributions $z = \frac{(x-\mu)}{\sigma}$

18. The number of text messages that teenagers send per month is normally distributed with a mean of 3,400 and a standard deviation of 450. If Kendra sent 4,415 text messages last month, find her z-score to the nearest hundredth.

    a. 2.26 b. -2.26 c. 1.3 d. 0.77

19. The daily high temperatures in Salt Lake for the first 15 days in June are normally distributed with a standard deviation of 5°F. If it was 70°F with a Z-score of -2.4, find the mean temperature.

    a. 90°F b. 78°F c. 85°F d. 82°F

20. Marco recently took a roadtrip across the country. The number of miles he drove each day was normally distributed with a mean of 450. If he drove 431.8 miles on the last day with a z-score of -0.7, what is the standard deviation?

    a. 18.2 b. 26 c. 12.74 d. -12.74

Use the following scenario and a <u>calculator</u> to answer questions 21-24: *(menu-6-5-2)*

The number of days a group of 250 homes is on the market is normally distributed with a mean of 50 and a standard deviation of 13. *Round your percents to 2 decimal places.*

21. What percent of homes are on the market less than a week (7 days)?

    a. 0.05% b. 5% c. 47% d. 50%

22. What is the probability that a home is on the market between 7 and and 30 days?

    a. .0619% b. 6.19% c. 6.15% d. 61.50%

23. What is the probability that a home is on the market more than 45 days?

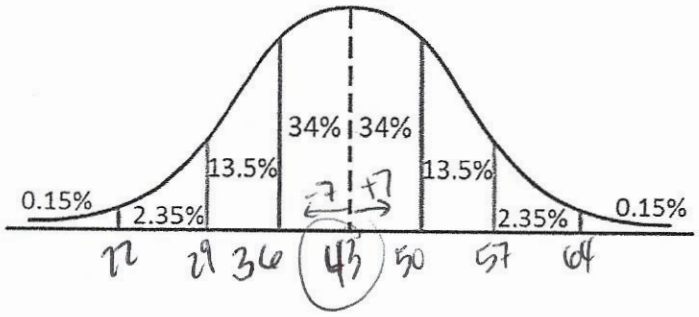
    a. 64.97% b. 0.6497% c. 35.03% d. 45.45%

24. My realtor recommends that if the property is for sale for 60 days, you should drop the price. **How many** out of the 250 homes, sell for full price in the first 59 days?

    a. 148 homes b. 61 homes c. 189 homes d. 76 homes

Key

25. From our in class Triangle Project, here is some data for the height of the school. The mean height was calculated to be 43 feet tall with a standard deviation of 7 feet. **Label** the curve below.



a. Between what two heights were the most common calculations? Middle 68 %= 36 - 50

b. What percent of calculations were between 29 feet and 43 feet? 47.5%

c. What percent of people over estimated the height greater than 57 feet tall? 2.5%

d. If 200 students participated in the project, **how many** students got an unreasonably small height where only at most .15% of their classmates got similar results? 30 people

.15 x200

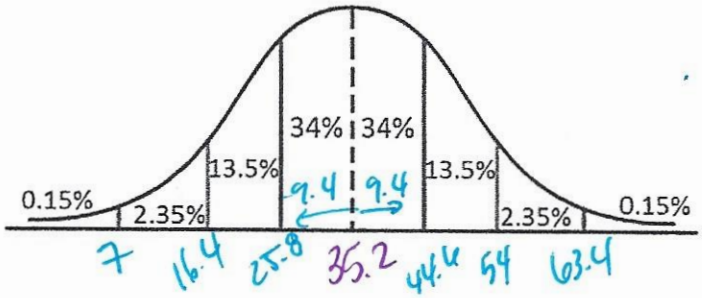
26. Another class during the Triangle Project calculated the height of the flagpole in feet.

{42.4, 36.02, 36, 27.92, 26.5, 34, 35, 32, 60, 22.5, 34.76} *(lists: menu-4-1-1)*

a. What is the average height of the flagpole? $\bar{x}$ 35.2 ft. (one decimal)

b. What is the Standard Deviation of this data? ± 9.4 (one decimal)

c. **Label** the Normal Distribution curve:



d. What percent of students calculated a below average height? 50%

e. Between what two heights were 95% of the calculations? 16.4 - 54

f. What percent of heights were at most 54 feet tall? 97.5 (100-2.5)

g. What percent had heights of at least 44.6? 16%

10

Sec 3

Name Key ID: 2

Period____

Statistics and Probability Test

Find the number of possible outcomes.

1) A math quiz has nine true/false questions.

A) 442 B) 515

C) 512 D) 719

2) A jewelry store sells gold and platinum rings. Each ring is available in eight styles and is fitted with one of ten gemstones.

A) 160 B) 91

C) 150 D) 187

State if each scenario involves a permutation or a combination.

3) The student body of 275 students wants to elect a president and vice president.

A) Permutation B) Combination

4) Perry has homework assignments in seven subjects. He only has time to do five of them.

A) Permutation B) Combination

Find the number of possible outcomes.

5) Sadie dropped a deck of cards. Which expression represents the number of ways she can pick up 7 of them.

A) $52! \cdot 7!$ B) ${}_{52}P_7$

C) ${}_{52}C_7$ D) $\frac{52!}{7!}$

6) To win the lottery, your numbers must match the selected numbers in order. How many ways can they select the winning order if there are seven balls and they will select 3?

A) 210 B) 110

C) 20 D) 126

Find the probability for the following Independent, Dependent, or Conditional Events.

7) A die is rolled then a letter in the word STATISTICS is randomly selected. What is the probability of rolling a three, then the letter I?

A) $\frac{1}{5}$ B) $\frac{3}{20}$

C) $\frac{1}{60}$ D) $\frac{13}{36}$

8) You flip a coin and then roll a fair six-sided die. The coin lands tails-up and the die shows an odd number.

A) $\frac{24}{121} \approx 0.198$ B) $\frac{25}{144} \approx 0.174$

C) $\frac{5}{18} \approx 0.278$ D) $\frac{1}{4} = 0.25$

9) A card is selected at random from a standard deck of 52 playing cards. What is the probability that it is a king, queen or jack(face-card)?

A) $\frac{3}{13}$ B) $\frac{10}{13}$

C) $\frac{9}{13}$ D) $\frac{4}{13}$

10) A card is randomly selected from a standard deck of 52 cards.

p(you DON'T get a face card | given it is red)

A) $\frac{6}{52}$ B) $\frac{10}{13}$

C) $\frac{12}{52}$ D) $\frac{1}{2}$

A cooler contains twelve bottles of sports drink: three lemon-lime flavored, four orange flavored, and five fruit-punch flavored.

11) You randomly grab abottle and give it to your friend. Then, you randomly grab a bottle for yourself.
P(Your friend gets a lemon-lime and you get an orange.)

A) $\frac{4}{35}$ B) $\frac{11}{105}$

C) $\frac{1}{11}$ D) $\frac{2}{63}$

12) You randomly grab a bottle.
Then you RETURN the bottle to the cooler, mix up the bottles, and randomly select another bottle.
P(Both times you get a lemon-lime drink)

A) $\frac{35}{132}$ B) $\frac{30}{121}$

C) $\frac{1}{11}$ D) $\frac{1}{16}$

Find the binomial probability of each event. ${}_nC_r \cdot p^r q^{n-r}$

13) A fair coin is flipped twelve times. What is the probability of the coin landing tails up exactly four times?

A) $\frac{15}{64} \approx 23.438\%$

B) $\frac{495}{4096} \approx 12.085\%$

C) $\frac{63}{256} \approx 24.609\%$

D) $\frac{35}{128} \approx 27.344\%$

14) One day, ten babies are born at a hospital. Assuming each baby has an equal chance of being a boy or girl, what is the probability that exactly five of the ten babies are girls?

A) $\frac{63}{256} \approx 24.609\%$ B) $\frac{15}{128} \approx 11.719\%$

C) $\frac{7}{32} = 21.875\%$ D) $\frac{55}{1024} \approx 5.371\%$

15) A six-sided die is rolled eight times. What is the probability that the die will show an even number at least seven times?

A) $\frac{193}{512} \approx 37.695\%$ B) $\frac{11}{64} \approx 17.188\%$

C) $\frac{29}{128} \approx 22.656\%$ D) $\frac{9}{256} \approx 3.516\%$

Find each term described.

16) 2nd term in expansion of $(x + y)^7$

A) $7xy^6$ B) $21x^5y^2$

C) x^7 D) $7x^6y$

17) 4th term in expansion of $(b + a)^4$

A) $4b^3a$ B) $4ba^3$

C) a^4 D) $6b^2a^2$

Name Key

Period_____

Probability and Statistics

Test B

Normal Curve Distributions $z = \frac{(x-\mu)}{\sigma}$

18. A radar detector records the speeds of a group of cars that pass by. If the mean is 46 mph and the standard deviation is 2.8 mph, find the z-scores for a car that was going 42 mph.

$\frac{42-46}{2.8} = -1.43$

a. -1.43 b. 1.43 c. 2.14 d. -0.77

19. The air pressure of each tire tested at a service station is normally distributed with a mean of 39.2 pounds per square inch(psi) and a standard deviation of 2.5 psi. If a tire has a z-score of -1.8, find it's air pressure.

$-1.8 = \frac{x-39.2}{2.5}$

$= 34.7$

a. 26 psi b. 15.6 psi c. 30.2 psi d. 34.7 psi

20. Marco recently took a roadtrip across the country. The price for gas along his route was normally distributed with a mean of \$3.18 per gallon. He got gas at Maverik for \$3.08, which had a z-score of -.89, find the standard deviation.

$-.89 = \frac{3.08-3.18}{\sigma}$

$= .11¢$

a. \$0.11 b. \$0.09 c. \$0.10 d. \$0.03

Use the following scenario and a <u>calculator</u> to answer questions 21-24: *(menu-6-5-2)*

The Clifbar factory in Idaho, makes 2,000 bars in each flavor batch. The machine cuts each bar to weigh an average of 2.4 ounces with a standard deviation of 0.3 ounces.

21. What percent of bars are less than 2 ounces?

-9999
2
2.4
.3

$= .0912$

a. 0.38% b. 3.8% c. 8% d. 9.12%

22. While Preparing to climb a mountain you are worried about every ounce of weight you carry. What is the probability the Clifbars weigh more than 3 ounces each?

3
9999
2.4
.3

$= .0227$

a. .615% b. 0.023% c. 2.3% d. 61.50%

23. Ideally the bars only weigh between 2.2 and 2.5 oz. What percent of the bars are ideal for climbers?

2.2
2.5
2.4
.3

$= .378$

a. 37.8% b. 1% c. 35.03% d. 10%

24. Clifbar determined that if a bar was smaller than 1.6 ounces they'd get complaints from customers who felt ripped off. Based on the likelihood of getting one of these small bars, **how many** customer complaints could they expect?

1.6

$.0038 \times 2000$

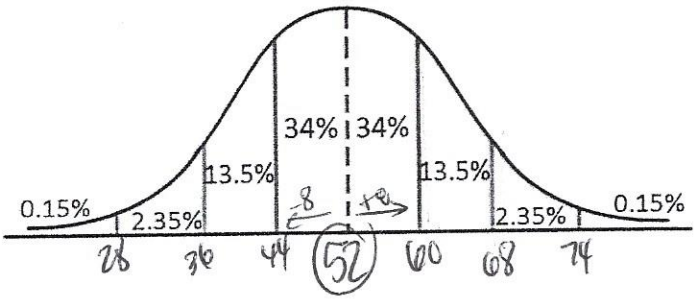
7.604

≈ 8 bars

a. 11 complaints b. 8 complaints c. 3 complaints d. 4 complaints

key

25. From our in class Triangle Project, here is some data for the height of a light post. The mean height was calculated to be 52 feet tall with a standard deviation of 8 feet. **Label** the curve below.



a. Between what two heights were the most common calculations? Middle 68 %= 44 - 60

b. What percent of calculations were between 36 feet and 60 feet? 81.5%

c. What percent of people over estimated the height greater than 60 feet tall? 16%

d. If 200 students participated in the project, **how many** students got an unreasonably small height where only at most .15% of their classmates got similar results? 30 people

.15 × 200 = 30

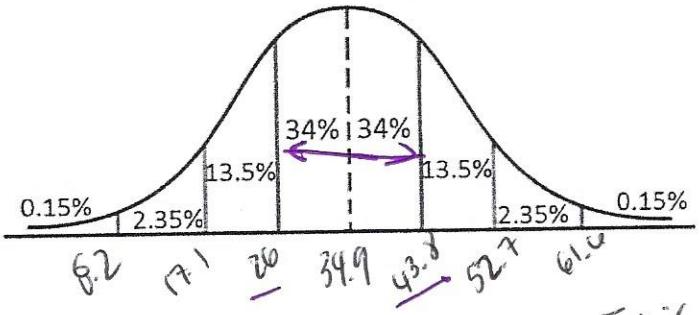
26. Another class during the Triangle Project calculated the height of the flagpole in feet.

{22.5, 34, 42, 36, 36.1, 27.92, 26.5, 35.04, 32, 58, 34} *(lists: menu-4-1-1)*

a. What is the average height of the flagpole? 34.9 ft. (one decimal)

b. What is the Standard Deviation of this data? ± 8.9 (one decimal)

c. **Label** the Normal Distribution curve:



d. What percent of students calculated a below average height? 50%

e. Between what two heights were 68% of the calculations? 26 - 43.8

f. What percent of heights were at most 52.7 feet tall? ~~95%~~ 97.5%

g. What percent had heights of at least 17.1? 97.5%

10