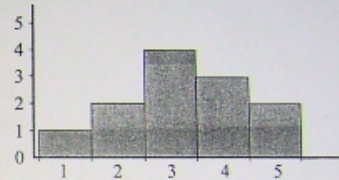


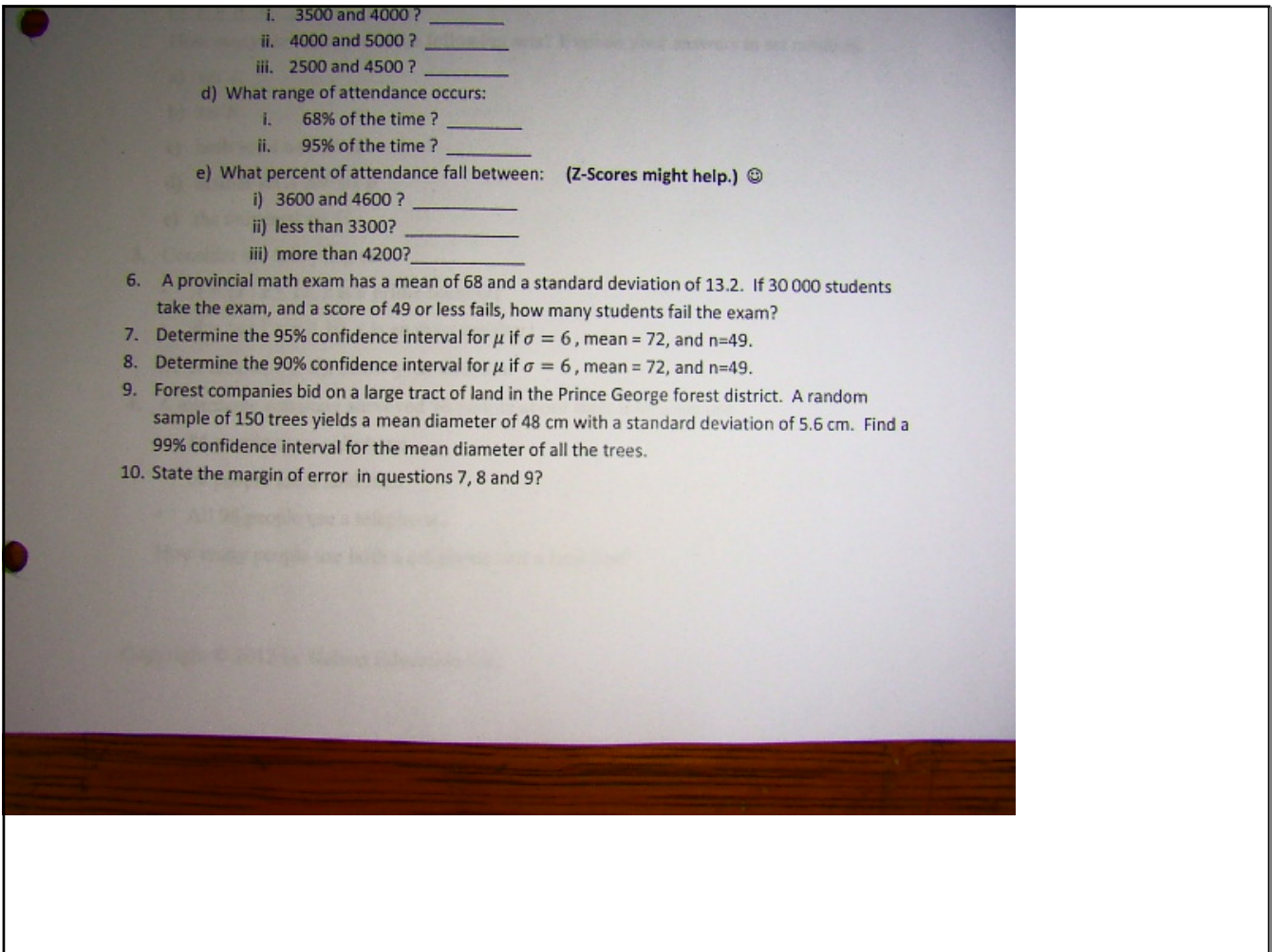
Statistics Exam Review

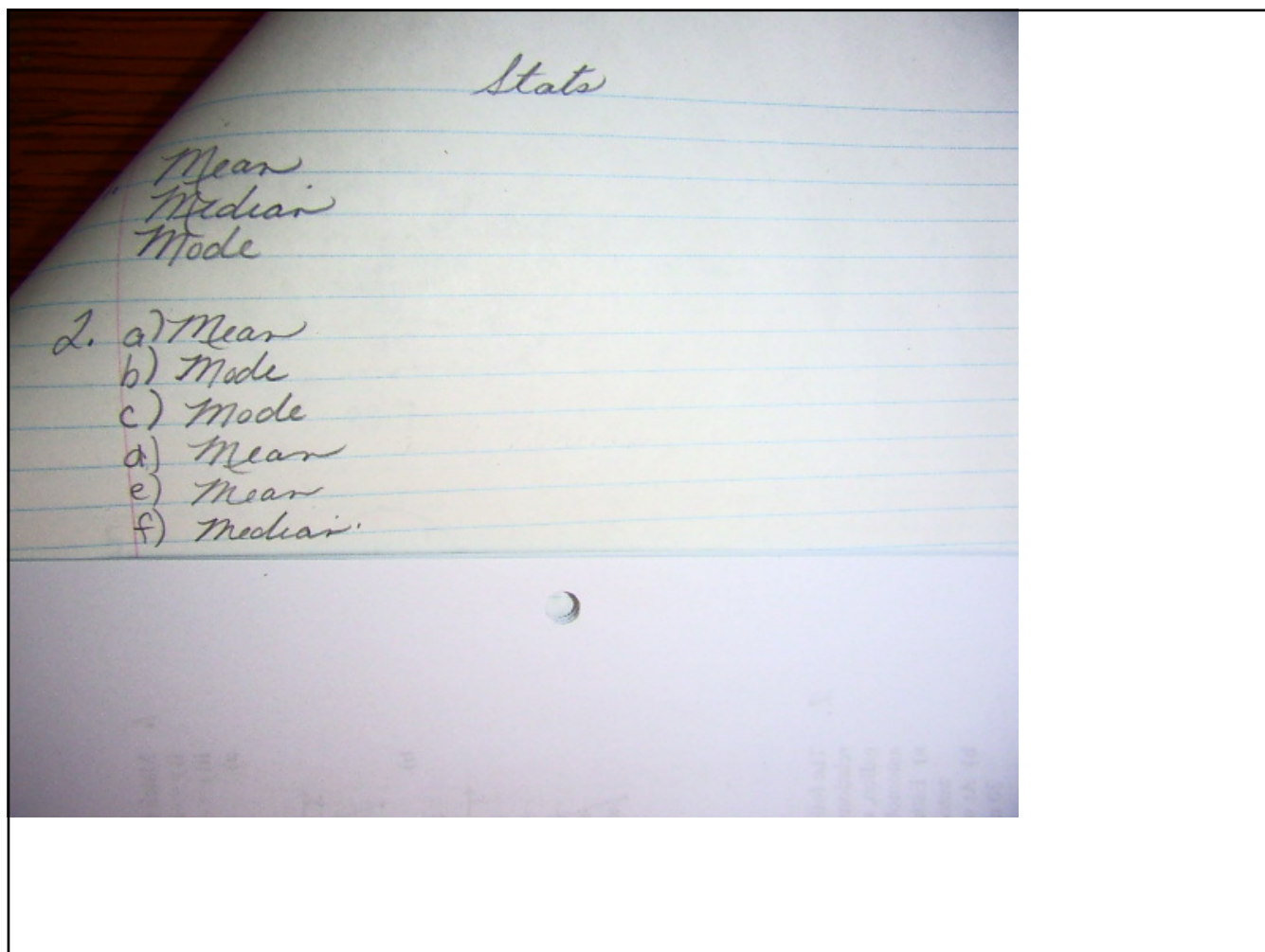
1. What are the three measures of central tendency? _____, _____, _____
2. Which measure of central tendency is
 - a. affected by extreme values? _____
 - b. can have more than one value? _____
 - c. is always part of the data? _____
 - d. requires using all values of the data? _____
 - e. least likely to be an actual score of the data? _____
 - f. is the center or middle value of the data? _____

3. Using the following histogram, determine the following:
 - a. Mean
 - b. Median
 - c. Mode
 - d. Standard Deviation



4. Draw and label the Normal Curve.
5. The attendance for a week at the local theatre is normally distributed, with a mean of 4000 and a standard deviation of 500.
 - a. Draw and label the normal curve.
 - b. What percent of attendance fall between:
 - i. 3500 and 4000 ? _____
 - ii. 4000 and 5000 ? _____
 - iii. 2500 and 4500 ? _____
 - d) What range of attendance occurs:
 - i. 68% of the time ? _____
 - ii. 95% of the time ? _____
 - e) What percent of attendance fall between: (Z-Scores might help.) 😊
 - i) 3600 and 4600 ? _____
 - ii) less than 3300? _____
 - iii) more than 4200? _____





3. Data:

1	$3.25 - 1 = 2.25$	5.0625
2	$= 1.25$	1.5625
2	1.25	1.5625
3	0.25	0.0625
3	0.25	0.0625
3	0.25	0.0625
3	0.25	0.0625
4	-0.75	0.5625
4	-0.75	0.5625
4	-0.75	0.5625
5	-1.75	3.0625
5	-1.75	3.0625

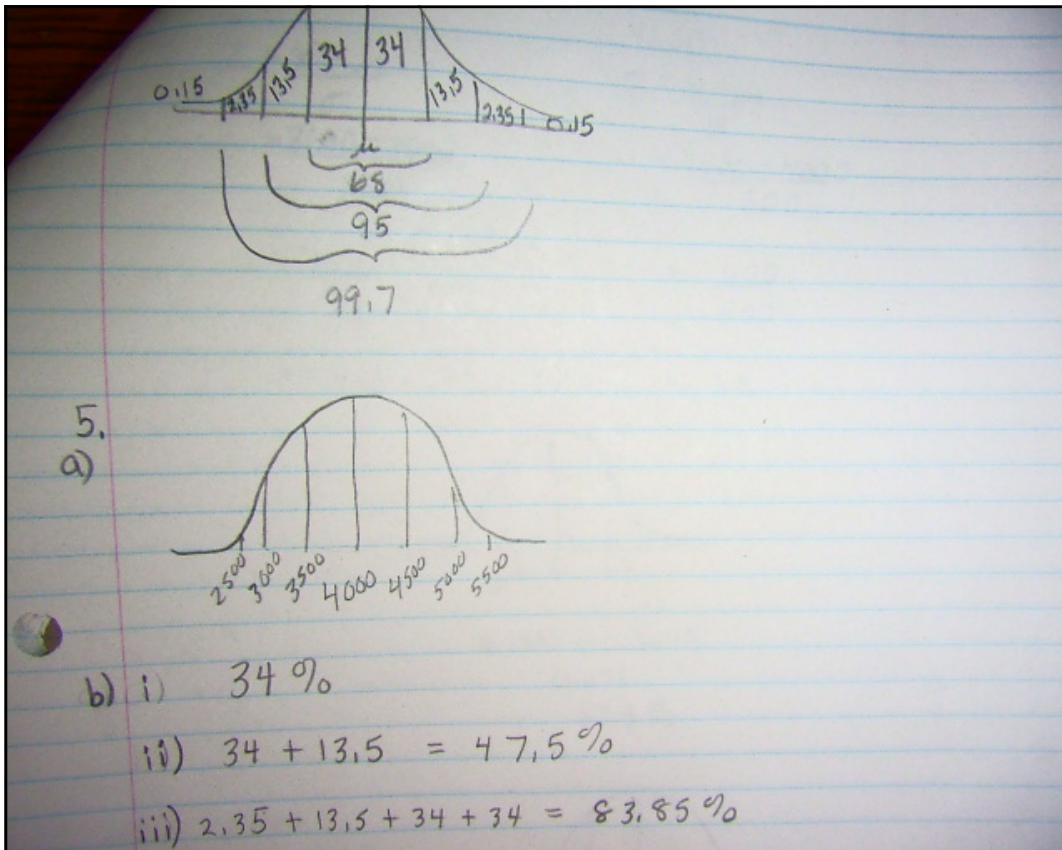
$$\frac{39}{12} = 3.25$$

$$\frac{16.25}{12}$$

$$\sqrt{1.354}$$

1.16 Standard Deviation

mean = 3.25
 median = 3
 mode = 3
 standard dev = 1.16



$$b) i) 34\%$$

$$ii) 34 + 13,5 = 47,5\%$$

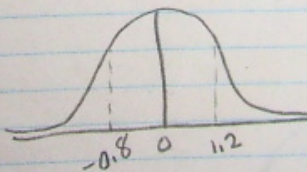
$$iii) 2,35 + 13,5 + 34 + 34 = 83,85\%$$

$$c) i) 68\% \quad 3500 - 4500$$

$$ii) 95\% \quad 3000 - 5000$$

$$\begin{aligned}
 & \text{a) i) } Z = \frac{x - \mu}{\sigma} \\
 & = \frac{3600 - 4000}{500} \\
 & = \frac{-400}{500} \\
 & = -0.8
 \end{aligned}$$

$$\begin{aligned}
 & Z = \frac{x - \mu}{\sigma} \\
 & = \frac{4600 - 4000}{500} \\
 & = \frac{600}{500} \\
 & = 1.2
 \end{aligned}$$



$$\begin{aligned}
 & 0.2881 + 0.3849 \\
 & 0.673 \\
 & 67.3\%
 \end{aligned}$$

e) < 3300

$$Z = \frac{x - \mu}{\sigma}$$

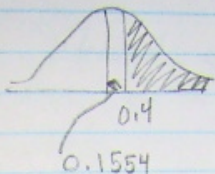
$$= \frac{3300 - 4000}{500}$$

$$= \frac{-700}{500}$$

$$= -1.4$$

$0.5 - 0.4192$
 0.0808

iii) > 4200



$$Z = \frac{X - \mu}{\sigma}$$

$$= \frac{4200 - 4000}{500}$$

$$= \frac{200}{500}$$

$$= 0.4$$

0.1554

$0.5 - 0.1554$

0.3446

6.

mean = 68
SD = 13.2

29.4 41.6 54.8 68 81.2 94.4 107.6

49 fails

Z-score.

$$Z = \frac{x - \mu}{\sigma}$$

$$= \frac{49 - 68}{13.2}$$

$$= \frac{-19}{13.2}$$


$$= -1.44$$

0.5 - 0.4251
0.0749
7.49%

30 000 x 0.0749
2247 students will fail

95% confidence interval for μ if $\sigma = 6$
 mean = 72
 $n = 49$

$$\bar{x} \pm z \frac{\sigma}{\sqrt{n}}$$

90% Confidence 

90% = 1.645
 95% = 1.96
 99% = 2.56

$$72 \pm 1.96 \left(\frac{6}{\sqrt{49}} \right)$$

$$72 \pm 1.96 (0.8571)$$

$$72 \pm 1.68$$

$72 + 1.68$	$72 - 1.68$
73.68	70.32

$$70.32 \leq \mu \leq 73.68$$

90% Confidence interval for μ if $\sigma=6$
mean = 72
 $n=49$

$$\bar{x} \pm Z \frac{\sigma}{\sqrt{n}}$$
$$72 \pm 1.645 \left(\frac{6}{\sqrt{49}} \right)$$
$$72 \pm 1.645 (0.8571)$$
$$72 \pm 1.41$$

$72 + 1.41$	$72 - 1.41$
73.41	70.59

$$70.59 \leq \mu \leq 73.41$$

9. 150 = n
48 = mean
5.6 = sd
99% =

$$\bar{x} \pm Z \frac{\sigma}{\sqrt{n}}$$
$$48 \pm 2.56 \left(\frac{5.6}{\sqrt{150}} \right)$$
$$48 \pm 2.56 (0.4572)$$
$$48 \pm 1.17$$

$48 + 1.17$	$48 - 1.17$
49.17	46.83

$$46.83 \leq \mu \leq 49.17$$

10 Margin of Error.

$$\bar{x} \pm Z \frac{\sigma}{\sqrt{n}}$$

$$7 \rightarrow 1.68$$

$$8 \rightarrow 1.41$$

$$9 \rightarrow 1.17$$

Chapter # 3.

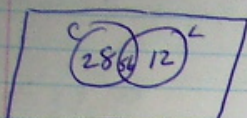
2. a) 7
b) 2
c) 1
d) 7
e) 15

3. $A = \{2, 3, 5, 7, 11, \}$

$$B = \{2, 4, 6, 8, 10, \}$$

$$n(A \cup B) = 9$$

H. 96

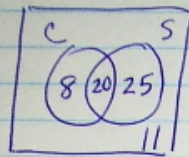


$$\begin{array}{r} 84 \\ + 68 \\ \hline 152 \end{array} \quad \begin{array}{r} 152 \\ - 96 \\ \hline 56 \end{array}$$

56

3

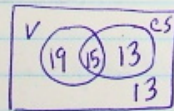
5. C 28
S 45
Both 20
Neither 11



$$8 + 20 + 25 + 11 = 64$$

6. 60 people.

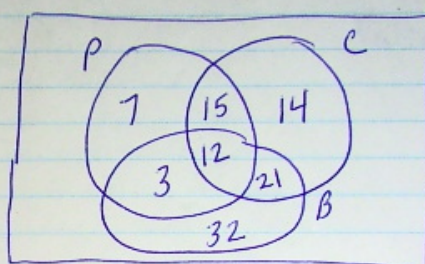
V 34
CS 28
13 neither



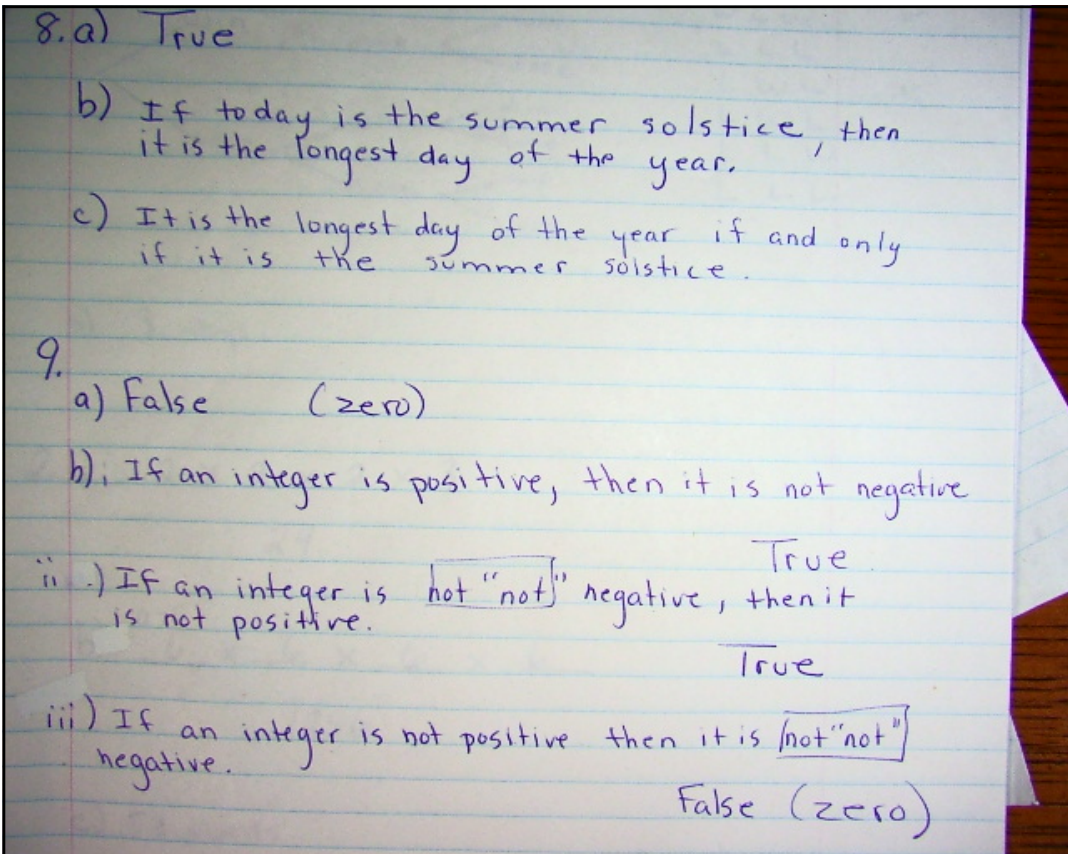
60	34	62
-13	+28	-47
47	62	15

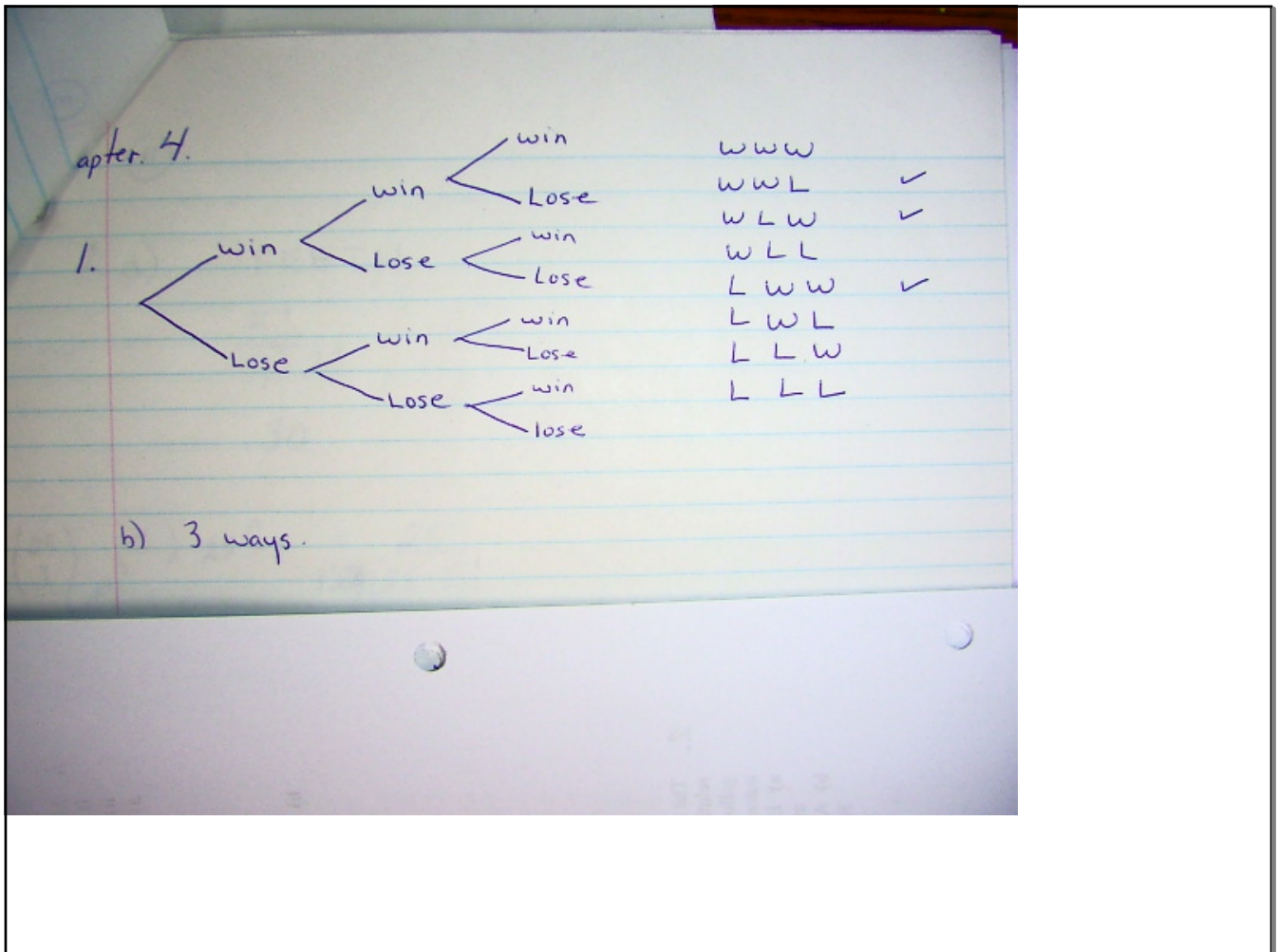
15

7. 37 P
62 C
68 B
27 PC
15 PB
33 CB
12 PCB



Total = 104.





2. a) $2 \times 2 \times 2 \times 3$
24.

b) $\frac{6^0 \times 6^5}{1296}$

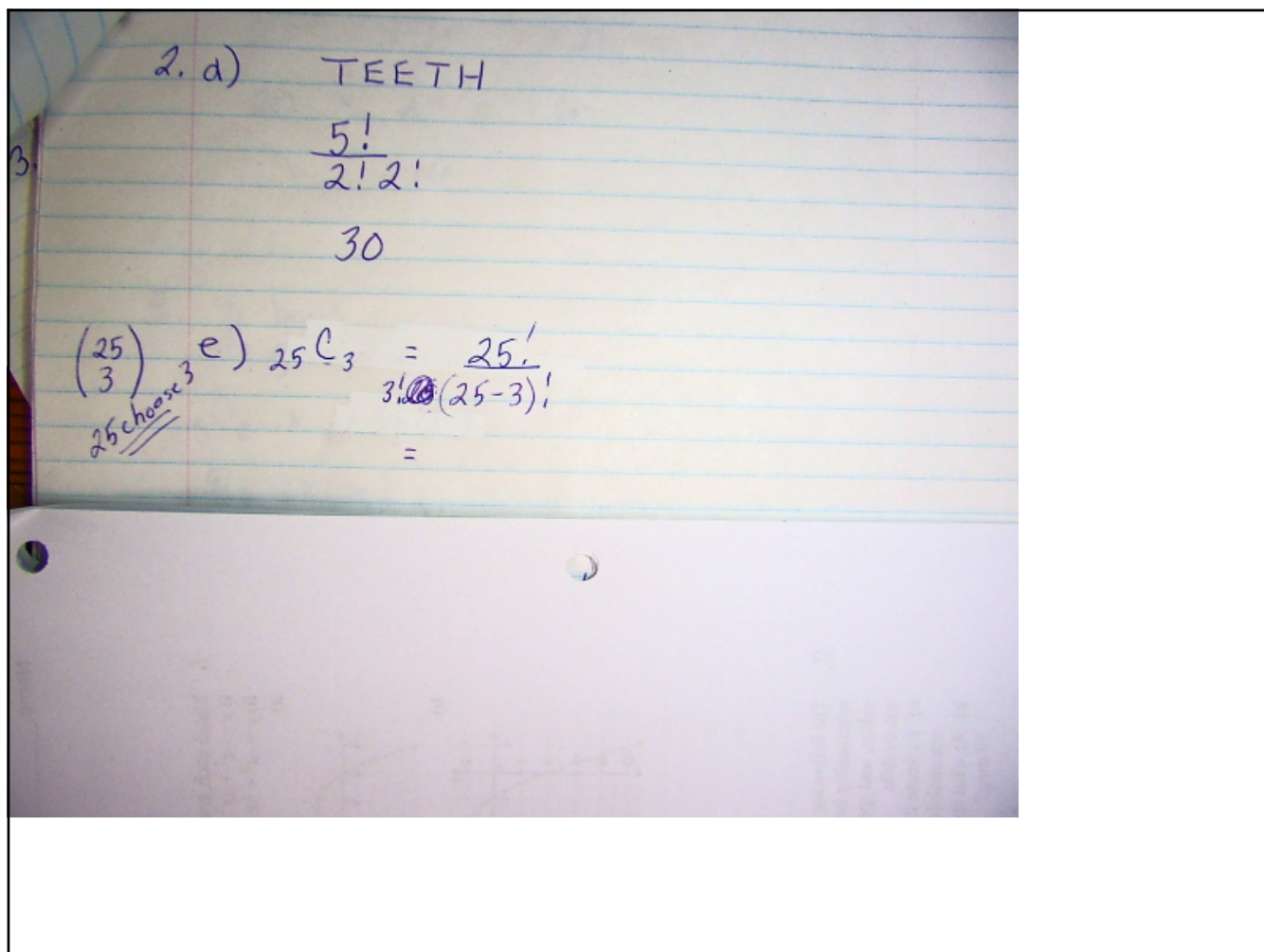
c) 52 cards

♠ or club

$$13 + 13$$

26 ways.

$$\frac{26}{52} = \frac{1}{2} \text{ Probability}$$



3. a) ${}_{10}C_5 = \frac{10!}{5!(10-5)!} = 252$

b) $10 \times 9 \times 8 \times 7 \times 6 = 30240$

c) Order doesn't matter in a
Order matters in b

4. $\frac{6!}{3!3!} \times \frac{2!}{1!1!} \times \frac{4!}{2!2!}$
 $20 \times 2 \times 6$
 240

5. 5 boys
6 girls

a) ${}^5C_2 \times {}^6C_2$
 $\frac{5!}{2!(5-2)!} \times \frac{6!}{2!(6-2)!}$
 10×15 = 150

5. 5 boys
6 girls

a) ${}^5C_2 \times {}^6C_2$

$$\frac{5!}{2!(5-2)!} \times \frac{6!}{2!(6-2)!}$$

10 x 15

$$= 150$$

b) ${}^5C_2 \times {}^6C_2$ OR ${}^5C_1 \times {}^6C_3$ OR ${}^5C_0 \times {}^6C_4$

$$\frac{5!}{2!(5-2)!} \times \frac{6!}{2!(6-2)!} + \frac{5!}{1!(5-1)!} \times \frac{6!}{3!(6-3)!} + \frac{5!}{0!(5-0)!} \times \frac{6!}{4!(6-4)!}$$

$$10 \times 15 + 5 \times 20 + 1 \times 15$$

$$150 + 100 + 15$$

$$265$$

(4)

c) Jim Nancy

$$\frac{9!}{1! 7!} = \frac{9!}{2!(9-2)!}$$

36

d) $5C_3 \times 6C_1 + 5C_4 \times 6C_0$

$$\frac{5!}{3!(5-3)!} \times \frac{6!}{1!(6-1)!} + \frac{5!}{4!(5-4)!} \times \frac{6!}{0!(6-0)!}$$

10 x 6 + 5 x 1

60 + 5

65

$$6. \quad nP_4 = 60 (nC_2)$$

$$\frac{n!}{(n-4)!} = 60 \left(\frac{n!}{2!(n-2)!} \right)$$

$$\frac{n!}{(n-4)!} = \frac{60 n!}{2 (n-2)!}$$

$$\frac{n(n-1)(n-2)(n-3)\cancel{(n-4)!}}{\cancel{(n-4)!}} = \frac{60(n)(n-1)\cancel{(n-2)!}}{2(n-2)!}$$

$$n(n-1)(n-2)(n-3) = 30(n)(n-1)$$

$$(n-2)(n-3) = 30$$

$$n^2 - 3n - 2n + 6 = 30$$

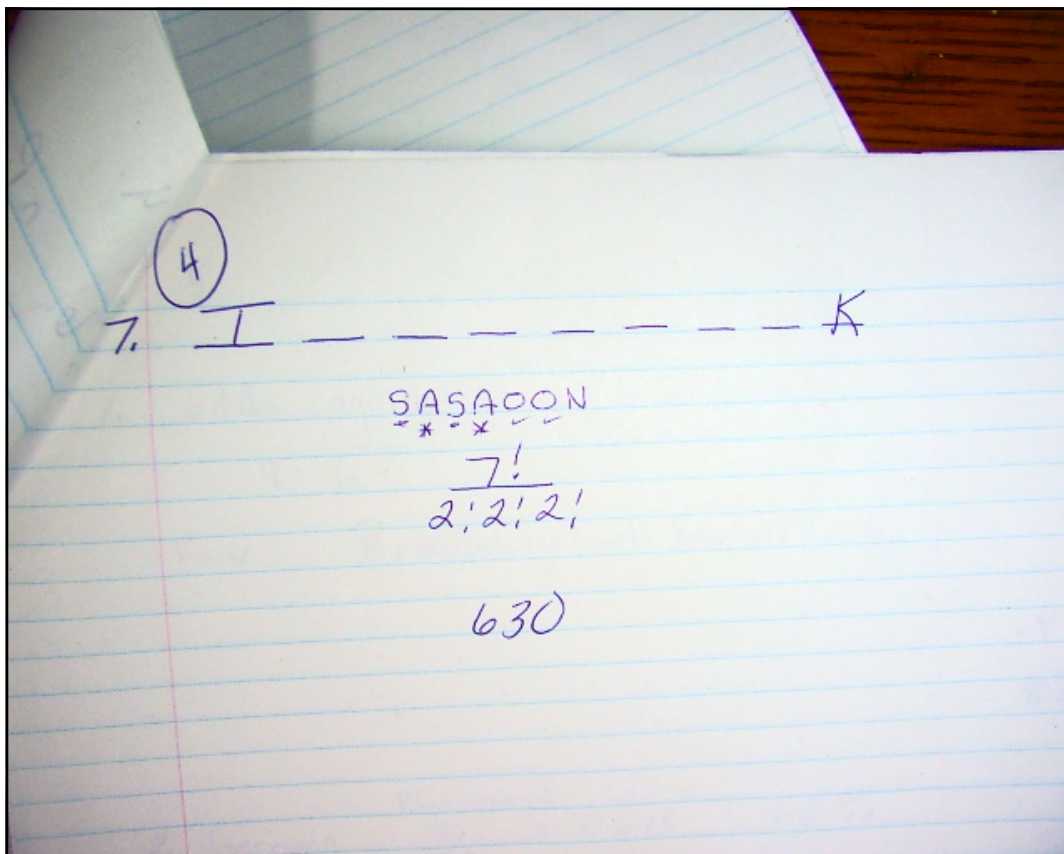
$$n^2 - 5n - 24 = 0$$

$$(n+3)(n-8) = 0$$

$$n = -3 \quad n = 8$$

$$\begin{aligned} 3 + (-8) &= -5 \\ 3 \times (-8) &= -24 \end{aligned}$$

$$\begin{array}{r} \wedge \\ 1 \quad 24 \\ 2 \quad 12 \\ \hline 3 \quad 8 \end{array}$$



pt. 5

1. odds against
9:6

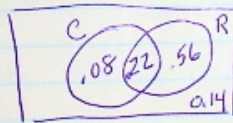
Fav Probability (will happen) = $\frac{6}{15} =$
= .4
= 40%

2. Germain $P(\text{winning}) = \frac{8}{13} = 0.615 \quad 62\%$

Gabriel $\frac{7}{11} = 0.636 \quad 64\%$

Start with Gabriel

3. rice 0.78% a)
 Carrots 0.30%
 Neither 0.14%



100	78	108
<u>- 14</u>	<u>+ 30</u>	<u>- 86</u>
86	108	22

b) Both 22%

(5)

$$4. P(7 \text{ spades face up}) = \frac{\# \text{ favourable}}{\text{Total \#}}$$

$$= \frac{13 C_7}{52 C_7}$$

<u>spades</u>	Any 7 cards	
$13 C_7$	$52 C_7$	$= \frac{1716}{133784560}$
$\frac{13!}{7!(13-7)!}$	$\frac{52!}{7!(52-7)!}$	$= 1.28 \times 10^{-5}$
		$= 0.0000128$

$= 0.0000128$

5. 3! -----

der
Counts
books 8!

$3! \times 8!$

ry Order -----
 $10!$

$P(3 \text{ books together}) = \frac{\text{favourable}}{\text{Total}}$

$= \frac{3! \cdot 8!}{10!} = \frac{3! \cdot 8!}{10 \times 9 \times 8!} = \frac{3 \times 2}{10 \times 9}$

$= \frac{4}{90} = 0.67\%$

6. a) $P(\text{both are red}) = \frac{\# \text{ of favourable}}{\text{Total}}$

7 red
5 blue

2 red. / Any 2
 7×6 / 12×11

$$= \frac{2 \text{ red}}{7 \times 6}$$
$$= \frac{7 \times 6}{12 \times 11}$$
$$= \frac{42}{132}$$
$$= 0.318$$
$$= 32\%$$

$$b) P(\text{both are blue}) = \frac{\# \text{ of favourable}}{\text{Total}}$$

$$\begin{array}{l} \text{blue} \\ 5 \times 4 \end{array} \left\{ \begin{array}{l} \text{Any 2} \\ 12 \times 11 \end{array} \right. = \frac{5 \times 4}{12 \times 11}$$

$$= \frac{20}{132}$$

$$= 0.1515$$

$$15.15\%$$

5)

R D $0.71 \times 0.85 = 0.6035$
 R \bar{D} $0.71 \times 0.15 = 0.1065$

B D $0.29 \times 0.30 = 0.087$
 B \bar{D} $0.29 \times 0.70 = 0.203$
1.00

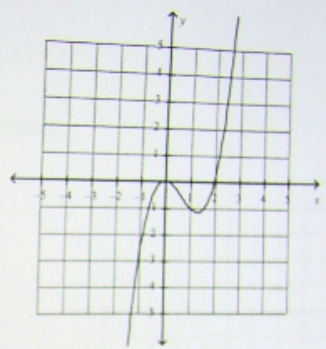
$P(\text{see another dog}) = 0.6035 + 0.087$
 0.6905
 69.9%

Multiple Choice

Identify the choice that best completes the statement or answers the question.

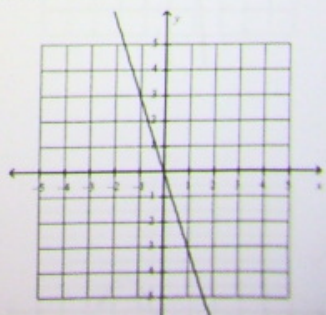
1. Identify this polynomial function:

- A. Linear
- B. Quadratic
- C. Cubic
- D. Exponential



2. Determine the number of turning points on this polynomial function:

- A. 0
- B. 1
- C. 2
- D. 3



3. Identify this polynomial function:

$$f(x) = \frac{3}{4} + 2x$$

- A. Linear
- B. Quadratic
- C. Cubic
- D. Exponential

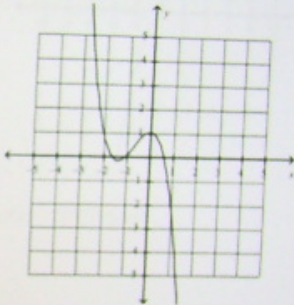
4. Identify this polynomial function:
 $f(x) = 4x - 2^3 + x$

$= 4x - 8 + x$
 $= 3x - 8$

A. Linear
 B. Quadratic
 C. Cubic
 D. Exponential

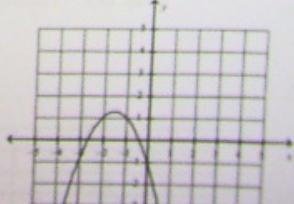
5. Determine the equation of this polynomial function:

A. $f(x) = -x^2 - 3x - 1$
 B. $g(x) = x^2 - 2x + 1$
 C. $h(x) = -x^3 - 2x^2 + 1$
 D. $j(x) = x^3 + 2x$



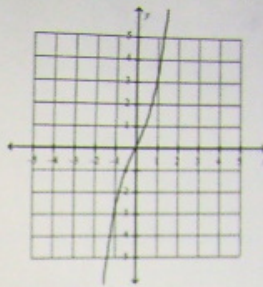
6. Determine the equation of this polynomial function:

A. $f(x) = -x^2 - 3x - 1$
 B. $g(x) = x^2 - 2x + 1$
 C. $h(x) = -x^3 - 2x^2 + 1$
 D. $j(x) = x^3 + 2x$



7. Fill in the blanks to describe the end behaviour of this polynomial function:
 As x approaches positive infinity, y approaches _____.

- A. 0
- B. Infinity
- C. -1
- D. Negative Infinity



8. How many x -intercepts does the exponential function $f(x) = 2(10)^x$ have?

- A. 0
- B. 1
- C. 2
- D. 3

9. How many turning points does the exponential function $f(x) = 2(\pi)^x$ have?

- A. 0
- B. 1
- C. 2
- D. 3

10. Match the following graph with its function.

- A. $y = 3(0.5)^x$
- B. $y = 2(1.25)^x$
- C. $y = 0.5(3)^x$
- D. $y = 2(0.75)^x$

