Name: _____ Date: _____ MBF 3C1

CHAPTER 2 REVIEW

2.1 – PROBABILITY EXPERIMENTS

1. In a probability experiment, **42 of the 70** trials were unsuccessful

(a) Write the *experimental probability* of an unsuccessful event. Express your answer as a fraction, decimal and percent.

(b) What is the *experimental probability* of a successful trial? Express your answer as a fraction, decimal and percent

2. A card was selected from a deck of **52** cards and then returned to the deck after each selection. After **50** trials, a total of **32 red cards** were selected

(a) Write the *experimental probability* of drawing a **red card**. Express the answer as a fraction in lowest terms, decimal and percent

(b) Write the *experimental probability* of drawing a **black card**. Express the answer as a fraction in lowest terms, decimal and percent

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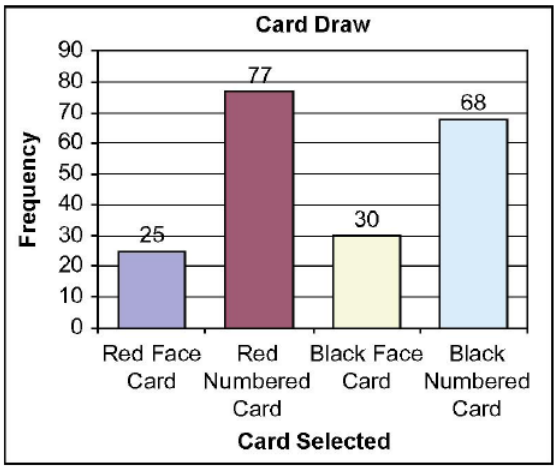
3. The graph shows the results of repeatedly drawing one card from a deck of cards and replacing it after the outcome is recorded.



(a) How many times was a card selected from the deck?

(b) What is the *experimental probability* drawing of a **black face** card from the deck? Write your answer as a fraction, decimal and percent

(c) Determine the *experimental probability* of drawing a **black numbered card** from the deck. Express your answer as a fraction, decimal and percent

4. Troy rolled a die **15 times**. On **8** of those rolls, he got a 2. Express the *experimental probability* of rolling a 2. Express your answer as a fraction, decimal and percent

5. A manufacturing process rejects a batch of items if more than **1.5%** of the items are defective.

(a) Calculate the *percentage* of defective items if there were **5 defective items** in a batch of **400**. Will this batch be rejected?

(b) If a batch of **2000** items were to be tested, how many items would be defective?

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2.2 – THEORETICAL PROBABILITY

1. Andre is drawing cards randomly from a deck of **52 cards** and <u>not</u> returning them to the deck. His first *two* cards are **aces**. What is the *theoretical probability* that the next card he draws will be another ace?

2. Two coins are tossed at the same time. Calculate the theoretical probability if

(a) **both** are heads (b) **neither** are heads (c) **one** is heads

3. A card is selected from a deck of cards. Calculate the *theoretical probability* of each outcome. Express all answers fractions in lowest terms

(a) a **red face** card

(b) a **black face card** that is **male (king or jack)**

(c) an <u>even</u> **numbered card** (Note: An *ace* is an odd numbered card)

(d) An <u>odd</u> **numbered spade**

(e) A **red ace**

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Name: _____ Date: _____ MBF 3C1

4. Two dice are rolled. Calculate the *theoretical probability* of each outcome. Express each of your answer as a fraction in lowest terms

(a) the sum of the results is **less than 5**

(b) both numbers on the dice are **greater than 4**

(c) one of the numbers is a **5**

(d) Both numbers are the **same**

(e) Both numbers are **different**

5. At a school assembly, there are **100 Grade 9s**, **125 Grade 10s, 225 Grade 11s** and **170 Grade 12s**. Everyone at the assembly entered their name for a door prize. Calculate the probability for each question and express as a fraction in lowest terms

(a) a **Grade 9 student**

(b) A **Grade 11 or 12 student**

(c) Only **Grade 12** students

Name: _____ Date: _____ MBF 3C1

2.3 – COMPARE EXPERIMENTAL and THEORETICAL PROBABILITIES

1. A modified dart board has equally spaced sectors containing the numbers **1 to 20.** Express each of your answers as a fraction in lowest terms

(a) What is the *theoretical probability* of hitting the numbers **18, 19** and **20**?

(b) In **75** of her first **80** throws, a dart player hits 18, 19 or 20. Calculate the *experimental probability* and express as a fraction in lowest terms

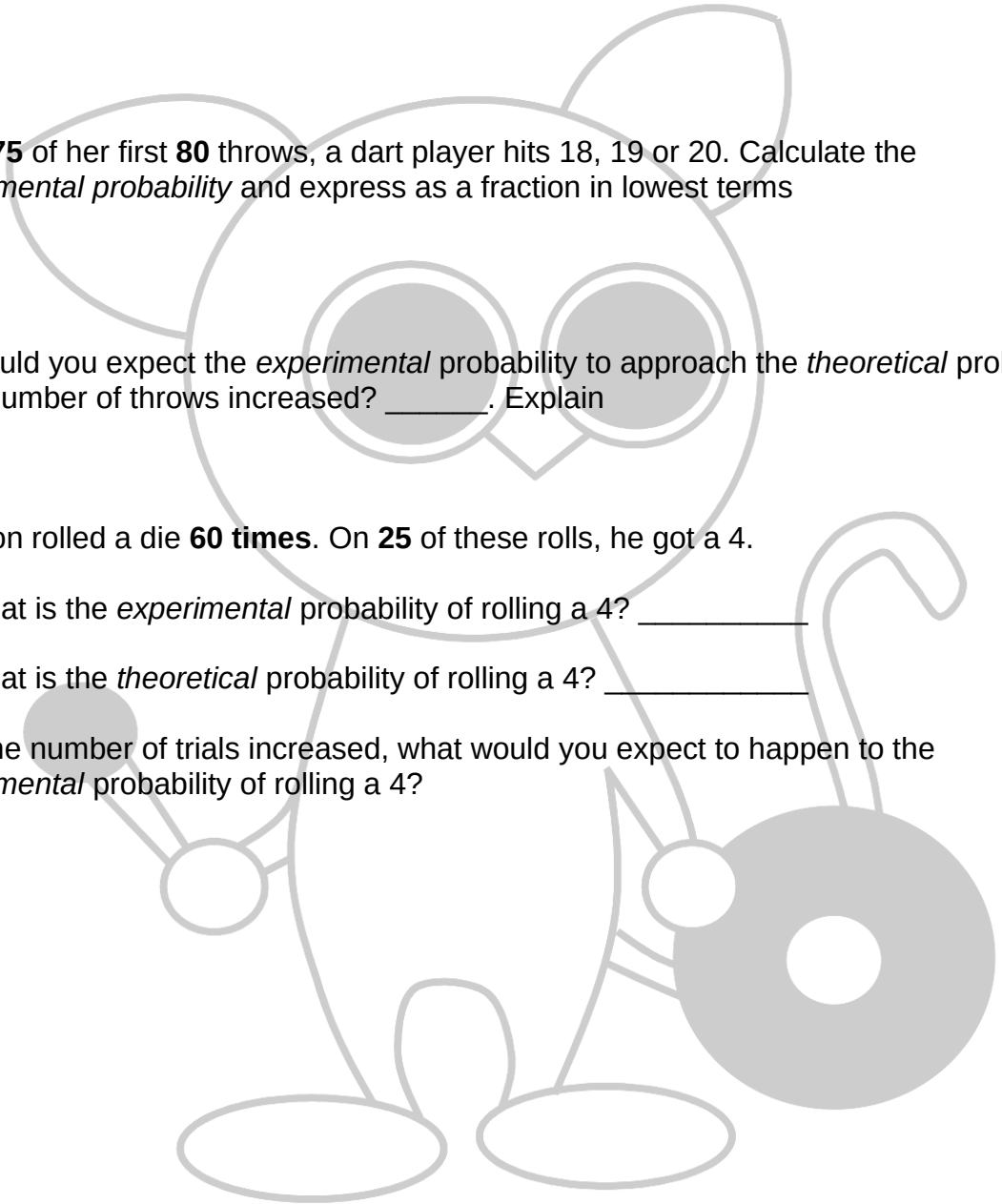
(c) Would you expect the *experimental* probability to approach the *theoretical* probability if the number of throws increased? _____. Explain

2. Anton rolled a die **60 times**. On **25** of these rolls, he got a 4.

(a) What is the *experimental* probability of rolling a 4? _____

(b) What is the *theoretical* probability of rolling a 4? _____

(c) If the number of trials increased, what would you expect to happen to the *experimental* probability of rolling a 4?



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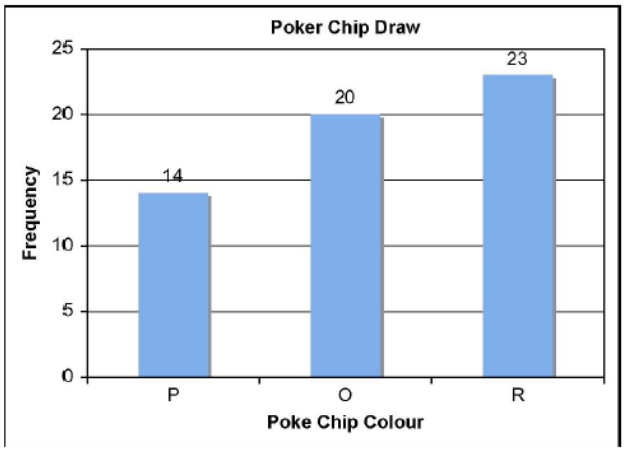
Name: _____ Date: _____ MBF 3C1

3. A bag contains **70** poker chips: **30 purple, 25 red** and **15 orange**. Jessie draws a chip, records the colour and returns it to the bag. The results are shown on the graph below



(a) What is the *experimental probability* of drawing each colour?

Purple: Red:

Orange:

(b) What is the *theoretical probability* of drawing each colour?

Purple: Red: Orange:

4. A **15 question** multiple choice quiz is given to a class. Each question has **5 choices**

(a) What is the *theoretical probability* of randomly choosing a correct answer?

(b) Manuel randomly chooses an answer for each question. How many questions can he expect to have answered correctly?

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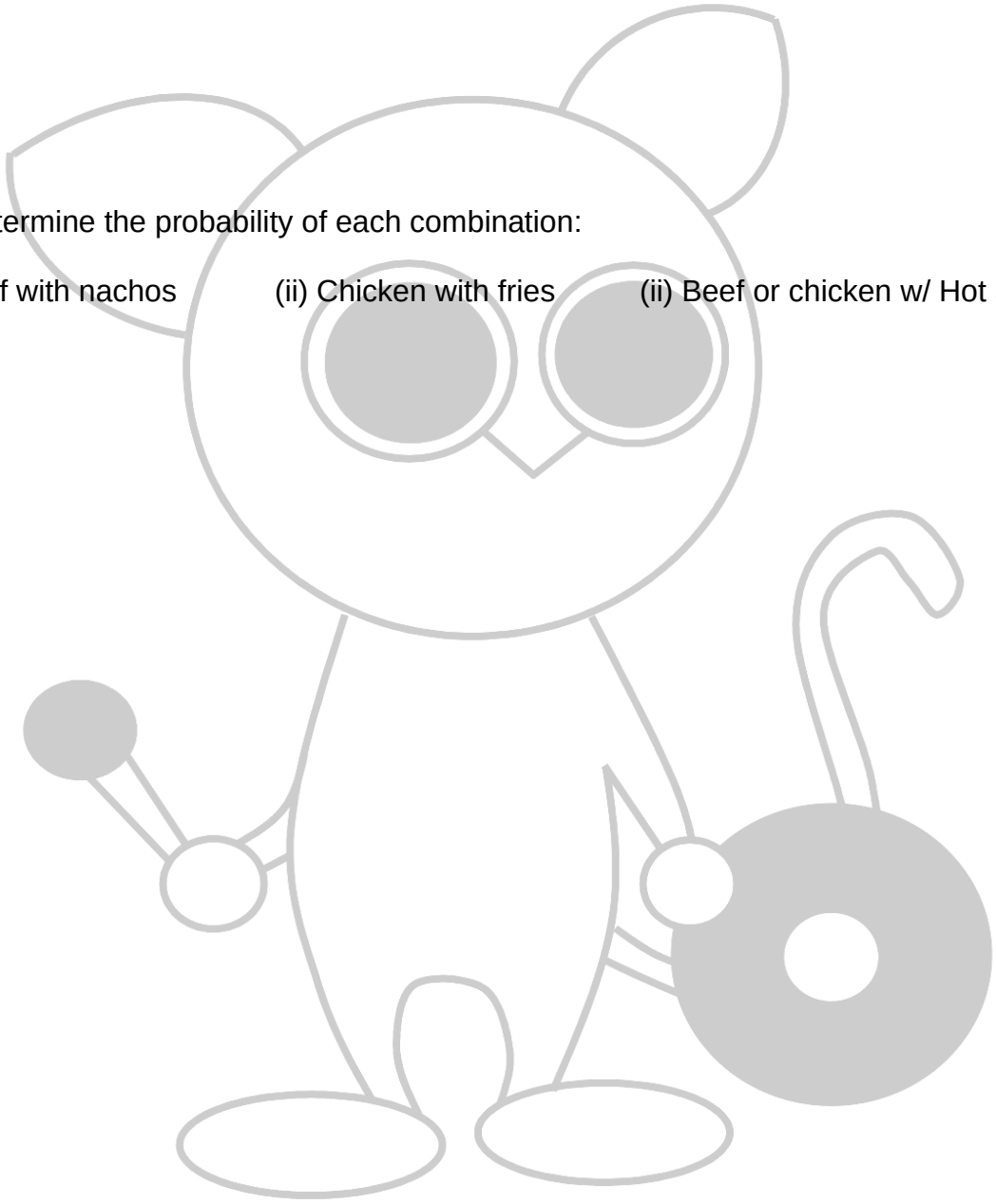
5. At *Mucho Taco*, you can purchase taco combos with the following options
   →Meat: **Beef (B)** or **Chicken (C)**
   →Sauce: **Mild (M)** or **Hot (H)**
   →Sides: **Nachos (N)** or **Fries (F)**

(a) Construct a **tree diagram** to illustrate the different combinations available



(b) Determine the probability of each combination:

(i) Beef with nachos (ii) Chicken with fries (ii) Beef or chicken w/ Hot Sauce

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2.4 – INTERPREST INFORMATION INVOLVING PROBABILITY

1. Nancy surveyed **100** students to determine their favourite after school snack. Complete the table below

SNACK	***PERCENT OF STUDENTS***	***(a) Express each percent as a fraction in lowest terms (an example is provided)***	***(b) Calculate how many students would prefer each snack if there are 1200 students in the school (an example has been provided)***
Cereal	8	$\frac{2}{25}$	$\frac{2}{25}\times 1200 = 96$
Fruit	28		
Chips	21		
Cookies	17		
Ice cream	26		

2. The table shows the maximum depth of each Great Lake.

Lake	**Maximum Depth (m)**
Huron	228
Erie	64
Ontario	224
Superior	406
Michigan	282

What is the probability that a Great Lake chosen at random will have a maximum depth

(a) **greater than 225 m**?

(b) **Less than 100 m** or **greater than 400 m?**

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Name: _____ Date: _____ MBF 3C1

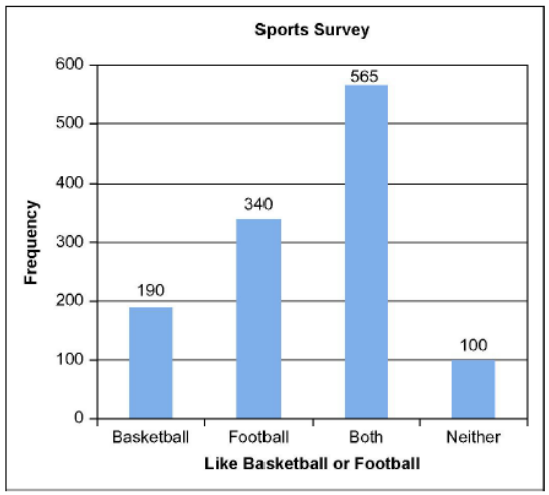
3. A basketball player successfully scored **135 of the 225 foul shots** he took in 4 games

(a) Calculate the *experimental probability* of successful shots

(b) How many successful shots would the player have if he took **30 foul shots**?

(c) How many successful shots would the player have if he took **2400 foul shots**?

4. All of the students at a high school were surveyed about two sports. The results are shown in the graph



What is the probability that a student chosen at random likes

(a) *only* **basketball**

(b) *either* basketball or football, but **not both**

(c) **basketball, football** or **both**

5. In a new sport, teams get **3 points for a regulation win**, **2 points for an overtime win** and **1 point** for a tie. No points are earned for losses. In the *first half* of the season, the local team has **15 regulation wins**, **11 overtime wins, 8 ties** and **22 losses**

(a) How many points does the team have after the first half of the season?

(b) If their performance is the *same* in the second half of the season, how many points will they have at the end of the season?

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Name: _____ Date: _____ MBF 3C1

6. A study found that **7 out of 10 students** surveyed listen to music when they study. If **40 students** were surveyed, how many would you expect to listen to music while studying?

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SOLUTIONS

2.1

1. (a) 3/5, 0.6, 60% (b) 2/5, 0.4, 40%

2. (a) 16/25, 0.64, 64% (b) 9/25, 0.36, 36%

3. (a) 200 times (b) 3/20, 0.15, 15% (c) 17/50, 0.34, 34%
   (d) 49/100, 0.49, 49%

4. 8/15, 0.533, 53.3%

5. (a) 1.25%, No (b) 30 items

2.2

1. 1/25

2. (a) 1/4 (b) 1/4 (c) ½

3. (a) 3/26 (b)1/13 (c) 5/13 (d) 5/52
   (e) 1/26

4. (a) 1/6 (b)1/9 (c) 11/36 (d) 1/6
   (e) 5/6

5. (a) 5/31 (b) 79/124 (c) 17/62

2.3

1. (a) 3/20 (b) 15/16 (c) No

2. (a) 5/12 (b) 1/6 (c) Approaching 1/6

3. (a) Red = 23/57 Orange = 20/57 Purple = 14/57
   (b) Red = 5/14 Orange = 3/14 Purple = 3/7

4. (a) 1/5 (b) 3 questions

5. (a) 8 combinations (b) (i) ¼ (ii) ¼ (iii) ½

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2.4

1. (a) Fruit = 7/25, Chips = 21/100, Cookies = 17/100, Ice cream = 13/50

   (b) Fruit = 336, Chips = 252, Cookies = 204, Ice cream = 312

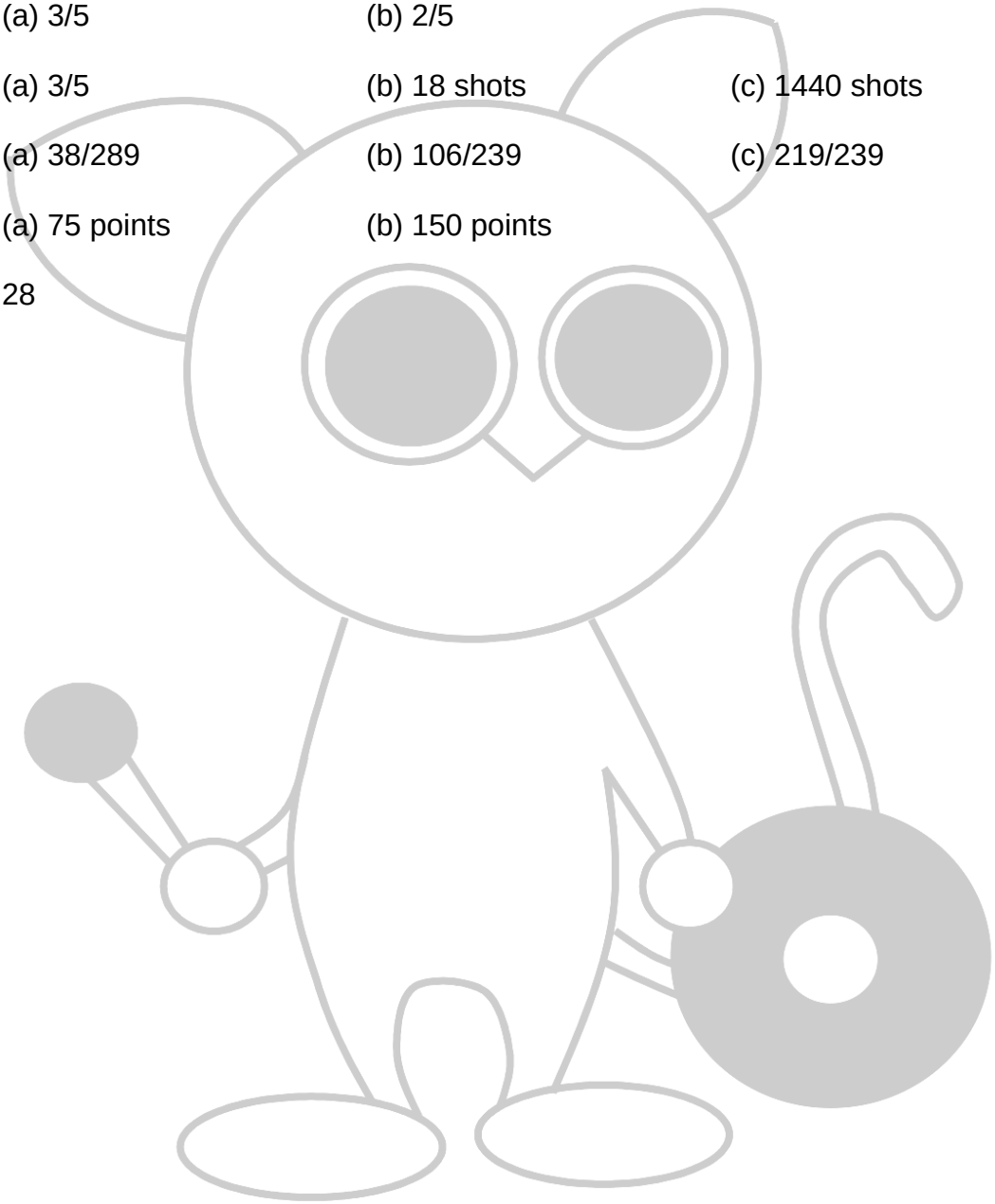
2. (a) 3/5 (b) 2/5

3 (a) 3/5 (b) 18 shots (c) 1440 shots

4. (a) 38/289 (b) 106/239 (c) 219/239

5. (a) 75 points (b) 150 points

6. 28



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