WORKSHEET: PROBABILITY

NAME: _____ **CLASS:** _____ **DATE:** _____

{1, 2, 3, 4, 5, 6, 7, & 9, 10 11, 12, 13, 14, 15, 16, 17, 18 19, 20}

Question 1

A bag contains 20 balls which are numbered from 1 to 20.
Find the probability of drawing at random, a ball that is

(a) an even number, *Answer:* P(even) = 1/2

(b) greater than 5 but smaller than 12, *Answer:* P(5<N<12) = 6/20 = 3/10

(c) a prime number, *Answer:* P(prime) = 8/20 = 2/5

(d) not a prime number. *Answer:* P(not prime) = 3/5

Question 2

A two-digit number is formed at random using the digits 2, 3, 4 and 5 with repetition of digits allowed.

(a) List the sample space. *Answer:* {22, 23, 24, 25, 32, 33, 34, 35, 42, 43, 44, 45, 52, 53, 54, 55}

(b) Find the probability of

(i) forming an odd number, *Answer:* P(odd) = 1/2

(ii) forming a number x, where $x > 44$, *Answer:* P(x>44) = 5/16

(iii) forming a number divisible by 5. *Answer:* P(÷5) = 4/16 = 1/4

Question 3

A box contains 30 apples, of which 14 are red and 16 are green.
An apple is picked at random from the box.

Find

(a) the probability of picking a green apple, *Answer:* $P(\text{Green}) = \frac{16}{30} = \frac{8}{15}$

(b) the number of red apples to be removed so that the probability of picking a green apple from the remaining apples in the box is 2/3.

let x -> be apples removed

Answer: $P(\text{Green, After}) = \frac{16}{30-x} = \frac{2}{3} = \frac{16}{24}$

x = 6

Question 4

A box contains 2 blue balls, 2 red balls and 1 green ball. A second box contains 1 red toy block, 1 green toy block and 1 yellow toy block. A ball and a toy block are drawn at random from their respective boxes.

	Blue	Blue	Red	Red	Green
Red	B, R	BR	R, R	R, R	G, R
Green	B, G	B, G	R, G	R, G	G, G
Yellow	B, Y	B, Y	R, Y	R, Y	G, Y

n(S) = 15

(a) Complete the possibility diagram above.

(b) Find the probability that the ball and toy block

(i) are both red in colour, *Answer:* P(RR) = 2/15

(ii) have the same colours, *Answer:* P(same) = 3/15 = 1/5

(iii) have different colours. *Answer:* P(diff colour) = 4/5

Question 5

A letter is selected at random from each of the two words 'EARTH' and 'MARS'.

(a) Complete the possibility diagram below showing all the possible outcomes.

	E	A	R	T	H
M	✓	✓			
A	✓	✓✓	✓	✓	✓
R	✓	✓	✓		
S	✓	✓			

$n(S) = 20$

(b) Find the probability that

(i) the two letters are the same, *Answer:* $P(\text{same}) = 2/20 = 1/10$

(ii) at least one of the two letters is a vowel. *Answer:* $P(\text{at least one vowel}) = 11/20$

Question 6

A box contains x red balls, $(x + 3)$ blue balls and $(3x - 1)$ white balls.

$3x-1$
$x+3$
x

(a) If the probability of drawing a red ball is 2/11, find the value of x.

$P(\text{red}) = \frac{x}{5x+2} = \frac{2}{11}$

$11x = 10x + 4$

$x = 4$

Answer: $x = 4$

(b) Find the probability of a white ball. *Answer:* $P(\text{white}) = 11/22 = 1/2$

Question 7

There are 5 discs in a bag, labelled with numbers from 3 to 7. Two discs are drawn at random, one at a time without replacement, from the bag. The possibility diagram below shows the product of the two numbers.

×	3	4	5	6	7
3		12 ✓	15 ✓	18 ✓	21
4	12 ✓		20 ✗	24	28
5	15 ✓	20 ✗		30 ✗	35 ✓
6	18 ✓	24	30 ✗		42 ✓
7	21	28	35 ✓	42 ✓	

Find the probability that the product of the two numbers is

(a) an odd number, *Answer:* $P(\text{odd}) = 6/20 = 3/10$

(b) a multiple of 10, *Answer:* $P(\text{10N}) = 4/20 = 1/5$

(c) less than 20 **OR** more than 30. *Answer:* $P(<20 \text{ or } >30) = 10/20 = 1/2$

Question 8

A card is taken from a well-shuffled standard pack of 52 cards. Find the probability that it is

(a) an ace of clubs, *Answer:* $P(A\clubsuit) = 1/52$

(b) a king, a queen or a jack, *Answer:* $P(K \text{ or } Q \text{ or } J) = 12/52 = 3/13$

(c) a red eight, *Answer:* $P(\text{red } 8) = 2/52 = 1/26$

(d) a heart or a queen, *Answer:* $P(\heartsuit \text{ or } Q) = \frac{13+3}{52} = 16/52 = 4/13$

(e) a black picture card or a five *Answer:* $P(\text{BPC or } 5) = 10/52 = 5/26$

6 4