SC/NATS 1870
Assignment 1: Comparative Mixing Processes
Due: Feb 23 2026, 11:59pm (online)

TEMPLATE FILE

Name (underline last): _____

Student Number: _____

My signature confirms that the work I am handing in is my own, and has not been copied, sourced from elsewhere, or otherwise falsified:

_____

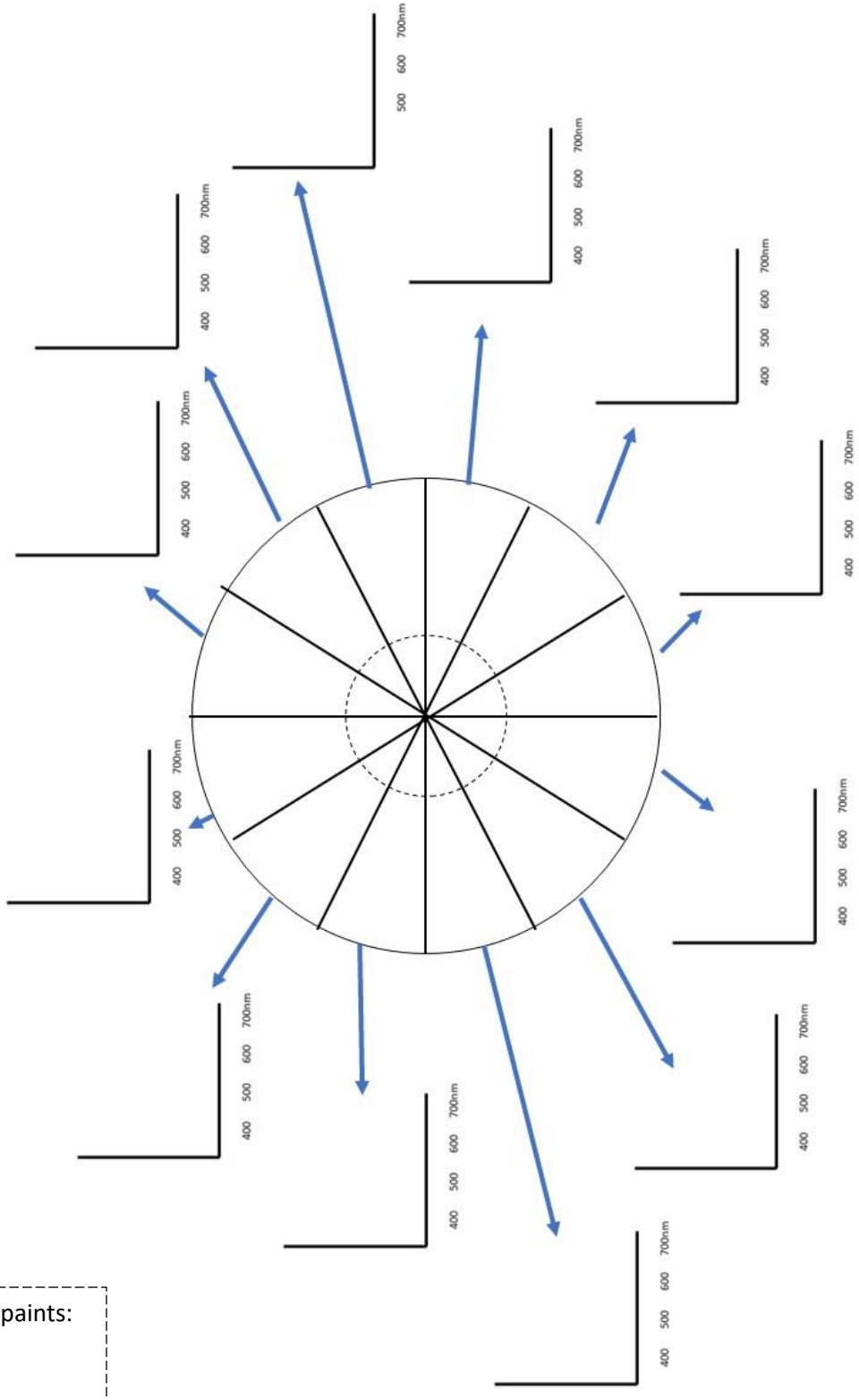
(1 mark)

- Save your file as a pdf (make sure file size is within stated limits), using filename: Lastname_Firstname_1870_A1.
- The marks allocated for each section are given in brackets after each question.

PART 1. Subtractive Mixing Process: Paints

Q1.1 Mixing intermediate hues (hue circle): (15 marks)

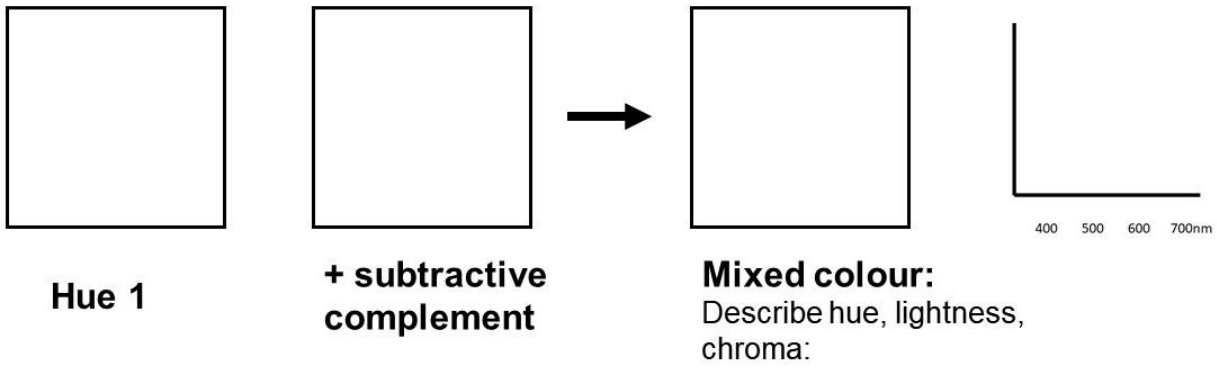
Insert image here:



Brand/name of paints:

Q1.2 Exploring Subtractive complements

a) **Insert image here: (3 marks)**



b) Describe the hue, lightness and chroma of your mixed colour: **(1 mark)**

- Hue:
- Lightness:
- Chroma:

c) Describe the process you took to achieve this grey (i.e. how did you need to vary proportions to get the grey?). If it is not fully achromatic, describe how you could adjust it. **(2 marks)**

d) **Insert image of your matching swatch from 3D model: (1 mark)**

e) Describe the how the subtractive mixing process occurs, and why you achieved your specific mixed colour for part a). **(4 marks)**

PART 2. Optical Mixing Process: Spinning Disks (Temporal Mixing)

Q2.1 Optical mixing

a) Method: Describe the mechanism used to spin the disk. **(1 mark)**

b) Observations: (12 marks)

Image of disk	**Discussion on how optically mixed colour compares to subtractively mixed colour.** *Be as precise as you can, and include hue, lightness and chroma of mixture (or if they are achromatic) in your answer. You can use your 3D model to help you identify and describe the optically mixed colours.*
Blue, Yellow 	*EXAMPLE: Optical mix is a pale, lime-green. Subtractive mix is dark green. Optical mix is lighter and has lower chroma than subtractive mix.* Describe what **you see** for **your** mixtures.
Blue, Yellow	** Do **your** blue and **your** yellow
Red, Green	
Red, Blue, Green	
Black, white	
Subtractive complements (Q1.2)	

Best optical mix for grey	** **Not using** black & white paints

c) Results: Describe what happened when you spun the disks. Are the subtractively mixed and optically mixed colours the same? If they are different, how are they different? What was your most surprising result? **(3 marks)**

d) The expected optical mixture of R, G and B is grey. Why? Did you achieve this? If not, can you explain why not? **(3 marks)**

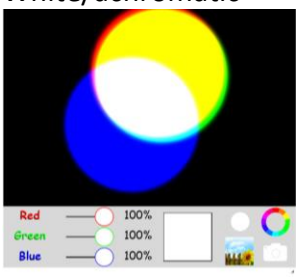
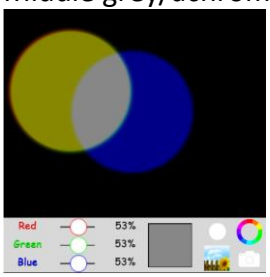
e) Explain how the process of optical mixing occurs, by specifically explaining your best optical mix of grey (i.e. which cones are activated, and to what degree). How did your best optical mix of grey compare to that using the subtractive complements of Q1.2? **(5 marks)**

f) How the optical mix of your best grey compare to the subtractively mixed colour? **(1 mark)**

PART 3. Additive Mixing Process: Lights on a Computer Screen

Q3.1 Computer screen mixing

a) Observations: (5 marks)

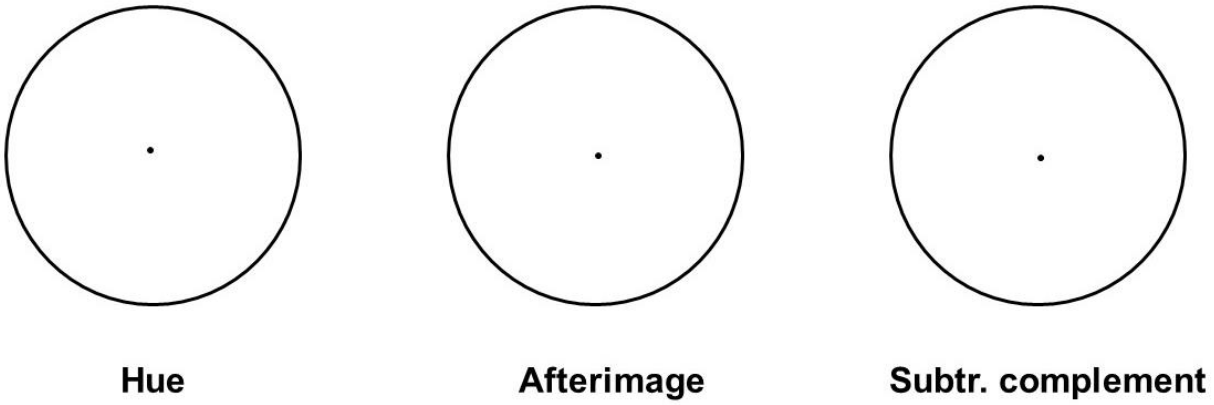
Coloured light sources for additive mix	a) Additively mixed colours at full (100%) intensity *Insert screenshot and describe the mix fully with its hue, lightness and chroma, or if it is achromatic*	b) Additively mixed colours at approximately 50% intensity. *Insert screenshot and describe the mix fully with its hue, lightness and chroma, or if it is achromatic*
Blue, yellow	White/achromatic 	Middle grey/achromatic 
Red, green		
Red, blue		
Magenta, green		
Red, green, blue		
Subtractive complements from **Q1.2**		

a) What is the computer screen additive mixture of R, G and B at 100% intensity? Describe how this mixture occurs (i.e. which cones are activated, and to what degree). **(3 marks)**

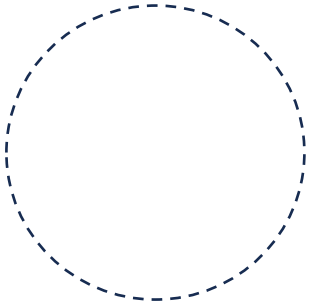
b) How does the simple additive mixture compare to the optical mix of your R, G, B spinning disk from Q2.1b? How does it compare to the subtractive mix? (Describe how the hue, lightness and chroma differ in each case.) **(3 marks)**

PART 4: Afterimage

Q4.1 Afterimage



(Optional) Attempted match of afterimage colour:



a) How does the colour of the afterimage compare to the colour in the right circle (i.e. the subtractive complement). Describe any differences in terms of hue, lightness and chroma, as well as the perceived luminosity of the afterimage. **(2 marks)**

b) Describe how your mixed colours from the same complementary pair differ, when they are mixed subtractively with paints, optically on a spinning disk, optically on a computer screen, and seen via afterimage. Comment on why the definition of 'complement' cannot be universally applied to specific pairs of perceived colours. **(5 marks)**

Total 70 marks