

**NO CALCULATORS****Part 1: Simplify**

1. Simplify:  $\frac{x^3 - 9x}{x^2 - 7x + 12}$

2. Simplify:  $\frac{\sqrt{x-2} + \frac{5}{\sqrt{x-2}}}{x-2}$

3. Simplify:  $\log_2 5 + \log_2(x^2 - 1) - \log_2(x - 1)$

4. Simplify:  $2 \log_4 9 - \log_2 3$

**Part 2: Solve**

1. Solve:  $4x^2 - 21x - 18 = 0$

2. The line with a slope of 5 passes through the point
- $(-1, 3)$
- and intersects the x-axis at what point?

3. Find the equation of the line that is perpendicular to the line
- $2x + 3y - 8 = 0$
- at the point
- $(1, 2)$
- .

4. Find the equation of the line that passes through the point
- $(2, 4)$
- and is parallel to the line
- $2x + 3y - 8 = 0$

### Part 3: Unit Circle

1. Evaluate:

a)  $\cos(0)$

b)  $\tan\left(\frac{\pi}{2}\right)$

2. Evaluate:

a)  $\arccos\left(\frac{\sqrt{3}}{2}\right)$

b)  $\arcsin\left(-\frac{1}{2}\right)$

### Part 4: Solve Again

1. Solve:  $2 \sin^2 \theta = 1 - \sin \theta$

2.  $2x + 1 = \frac{5}{x+2}$

3.  $\frac{x+1}{x} - \frac{x}{x+1} = 0$

4.  $\frac{2x}{4\pi} + \frac{1-x}{2} = 0$

### Part 5: Miscellaneous

1. Find  $\frac{f(x+h)-f(x)}{h}$  for  $f(x) = 8x^2 - 1$ .

2. Evaluate  $\lim_{x \rightarrow 2} \frac{(x^2-4)}{x-2}$

3. What is the domain for the function  $f(x) = \ln(2x - 12)$

4. Complete the square:  $x^2 + 4x + 3$