

Name Key DUE DATE: _____**Directions:**

- Read each problem carefully and use your knowledge of mathematics to determine your answer.
- In order to receive FULL CREDIT you must either SHOW ALL WORK or EXPLAIN how you got your answer!! PLEASE NOTE: A multiple choice answer alone without any work will only receive half credit.

Question	Your Work/Explanation
1) Find the sum of $\sum_{n=1}^5 \frac{4n+6}{10}$	$\frac{4(1)+6}{10} \quad \frac{4(2)+6}{10} \quad \frac{4(3)+6}{10} \quad \frac{4(4)+6}{10} \quad \frac{4(5)+6}{10}$ $1 + \frac{14}{10} + \frac{18}{10} + \frac{22}{10} + \frac{26}{10}$ $\frac{90}{10} = \boxed{9}$
2) Find the exact value, in radians, of the real number θ between $(0, 2\pi)$ where $\cos\theta = -\frac{\sqrt{3}}{2}$ and $\tan\theta > 0$ $\frac{S}{T} \mid \frac{A}{e}$	$\boxed{7\frac{\pi}{6}}$
3) Simplify: $\frac{\left(\frac{1-x}{2}\right)}{\left(3-\frac{2}{x}\right)}$	$\frac{1-x}{2} \cdot \frac{x}{3x-2}$ $\boxed{\frac{x(1-x)}{2(3x-2)}}$

- 4) Find the first four terms of the following sequence

$$a_n = \frac{3^n}{n!}$$

$$a_1 = \boxed{3}$$

$$a_2 = \frac{9}{2!} = \boxed{\frac{9}{2}}$$

$$a_3 = \frac{27}{3!} = \boxed{\frac{27}{6}}$$

$$a_4 = \frac{81}{4!} = \boxed{\frac{81}{24}}$$

- 5) If $f(x) = 3x + 1$, then find $f^{-1}(-3)$.

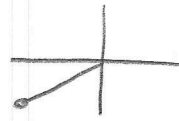
$$x = 3y + 1$$

$$\frac{x-1}{3} = y^{-1}$$

$$\frac{-3-1}{3} = \boxed{-\frac{4}{3}}$$

- 6) What angle, $[0, 2\pi]$, intersects the unit circle at the point $(-\frac{1}{2}, -\frac{\sqrt{3}}{2})$?

C S



$$\boxed{\frac{4\pi}{3}}$$

- 7) Write the equation of the line that passes through the point $(5, -3)$ and is perpendicular to the line

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

$$m = -2/5$$

$$y + 3 = -\frac{2}{5}(x - 5)$$

\approx

$$\boxed{y = -\frac{2}{5}x - 1}$$

8) Simplify: $\frac{7!}{4!(7-4)!}$

$$\frac{7 \times \cancel{6} \times 5 \times \cancel{4} \times \cancel{3} \times \cancel{2} \times 1}{(\cancel{4} \times \cancel{3} \times \cancel{2} \times 1)(\cancel{3} \times \cancel{2} \times 1)}$$

$$\boxed{35}$$

9) Find the exact value of $\csc -\frac{5\pi}{6}$.



$$\sin\left(-\frac{5\pi}{6}\right) = -\frac{1}{2}$$

$$\csc\left(-\frac{5\pi}{6}\right) = \boxed{-2}$$

10) Find $f(x-1)$ if $f(x) = 3x^2 - 5x - 5$

$$3(x-1)^2 - 5(x-1) - 5$$

$$3(x^2 - 2x + 1) - 5x + 5 - 5$$

$$3x^2 - 6x + 3 - 5x$$

$$\boxed{3x^2 - 11x + 3}$$

11) Find the 5th term of the recursive sequence

$$a_{k+1} = 2a_k - 1 \text{ where } a_1 = 2$$

$$a_1 = 2$$

$$a_2 = 2(2) - 1 = 3$$

$$a_3 = 2(3) - 1 = 5$$

$$a_4 = 2(5) - 1 = 9$$

$$a_5 = 2(9) - 1 = \boxed{17}$$

12) Solve: $\frac{5}{t+1} + \frac{2}{t-2} = \frac{13}{t^2-t-2}$

$$\frac{5(t-2) + 2(t+1)}{t^2-t-2} = \frac{13}{t^2-t-2}$$

$$5t - 10 + 2t + 2 = 13$$

$$7t - 8 = 13$$

$$7t = 21$$

$$\boxed{t=3}$$