Name:_____   Date:_____

Math 9 Honours Section 6.6b Solving Equations with Trigonometry

1. Evaluate each expression without a calculator:

a) $\cos 90° + 5\sin 270°$	b) $5\sin 180° + 4\cos 0°$	c) $\sin 90° - 3\cos 180°$
d) $6\cos(-270°) + \sin(-90°)$	e) $3\sin 45° - 4\cos 150°$	f) $-2\sin(225°) + \dfrac{2}{3}\tan(135°)$
g) $2\tan^2 120° + 3\sin^2 60°$	h) $-3\cos^2 150° - 3\sin^2(-225°)$	i) $-3\sin^2 300° - 3\cos^2(-60°)$

2. Solve for θ between $0° \le \theta \le 360°$

a) $3\sin\theta - 3 = 0$	b) $\sqrt{2}\cos\theta + 1 = 0$	c) $\sqrt{2}\sin\theta - 1 = 0$
d) $2\cos\theta + \sqrt{3} = 0$	e) $\tan\theta - \sqrt{3} = 0$	f) $2\tan\theta + 2\sqrt{3} = 0$

g) $\sin^2 \theta - 1 = 0$	h) $4\sin^2 \theta - 1 = 0$	i) $4\cos^2 \theta - 3 = 0$

3. Solve for θ between $0° \le \theta \le 360°$

a) $\sin \theta = \cos \theta$	b) $2\sin^2 \theta = \sin \theta$
c) $2\sin^2 \theta = \sin \theta + 1$	d) $2\sin^2 \theta = \sin \theta + 5$
e) $2\cos^2 \theta + 7\cos \theta = 4$	f) $2\sin^2 \theta - 11\sin \theta = 6$
g) $\left(4\sin^2 - 1\right)\left(\sin^2 \theta - 1\right) = 0$	h) $\cos^2 \theta - 3\sin \theta + 1 = 0$

i) $2\sin\theta \times \cos\theta = \sin\theta$	j) $7 + 4\cos\theta - 4\sin^2\theta = 0$
k) $2\sin^3\theta - 2\sin^2\theta - \sin\theta + 1 = 0$	$4\cos^4\theta + 3\cos^2\theta = 1$

4. If $\cos\theta = \dfrac{\sqrt{5}}{6}$, then what is the exact value of $\sin\theta$ and $\tan\theta$

5. If $\tan\theta = 2$ and θ is in quadrant III, then what is the exact value of $\sin\theta$ and $\cos\theta$?

6. Given $0° \le \theta \le 360°$, if $\sin\theta = k$ and there is only one solution, what are the possible value(s) of k?

7. Given $0° \le \theta \le 360°$, if $\sin\theta = k$ and there are three solutions, what are the possible value(s) of k?

8. Suppose $A + B = 180°$, then which of the following statements are true?
   i) $\sin A = \sin B$ ii) $\cos A = \cos B$ iii) $\tan A = -\tan B$

9. If $0° \leq \theta \leq 360°$ then what is the minimum value and maximum value of the expression:
   $2\sin^2 \theta + \cos^2 \theta + 1$

10. How many solutions will the following equation have? $\sin \theta \times \cos \theta \times \tan \theta = 0$

11. Given that $x\cos \theta + y\sin \theta = 4$ and $x\sin \theta - y\cos \theta = 3$, then which of the following statements is correct?
    i) $x + y = 5$ ii) $x + y = 7$ iii) $x^2 + y^2 = 5$ iv) $x^2 + y^2 = 25$

12. If $0° \leq \theta \leq 2016°$, how many angles satisfy the equation: $\sin^2 2016° + \sin^2 \theta = 1$ (CNML 2016).