Name: _____

Date: _____

K (30%)	A (30%)	T (20%)	C (20%)
/16	/16	/11	/11

MHF4U Quiz 7A: Chapter 7 **Total Mark: /54**

Full Answer: Label and draw each required graph. Show all calculations and write conclusion sentences**.**

1. Use the appropriate compound-angle formula to express $\sin\frac{5\pi}{4}\cos\frac{13\pi}{12}-\sin\frac{13\pi}{12}\cos\frac{5\pi}{4}$ as a single trigonometric expression, and then determine its exact value from the CAST rule and special triangles. **[K – 3]**

2. Use the appropriate compound-angle formula, the CAST rule and special triangles to compute the exact value of $\tan\left(\frac{7\pi}{6}+\frac{7\pi}{4}\right)$. **[K – 4]**

3. Use the appropriate double-angle formula and special triangles to find the exact value of $2\sin\left(\frac{\pi}{6}\right)\cos\left(\frac{\pi}{6}\right)$. **[K – 2]**

4. Solve $2\sin^2 x+\sqrt{3}\sin x=0$ for $0\le x\le 2\pi$. **[T – 5]**

5. For each of the following expressions, determine an appropriate positive or negative sine or cosine function that completes each statement, thus creating an equivalent trigonometric expression to sin α.

[K – 3]

a) $\sin\alpha =$ _____ $\left(\alpha - \frac{\pi}{2}\right)$

b) $\sin\alpha =$ _____ $(\alpha - \pi)$

c) $\sin\alpha =$ _____ $\left(\alpha - \frac{3\pi}{2}\right)$

6. Show the derivation of the double-angle formulas for sin2θ and cos2θ. **[A – 6]**

7. If $\cos x = \frac{7}{9}$, solve for $\sin 2x$ in exact form, given that $0 \le x \le \frac{\pi}{2}$. **[T – 6]**

8. Prove the trigonometric identity $\frac{\cos(x-y)}{\cos(x+y)} = \frac{1+\tan x \tan y}{1-\tan x \tan y}$. **[A – 1, C – 2]**

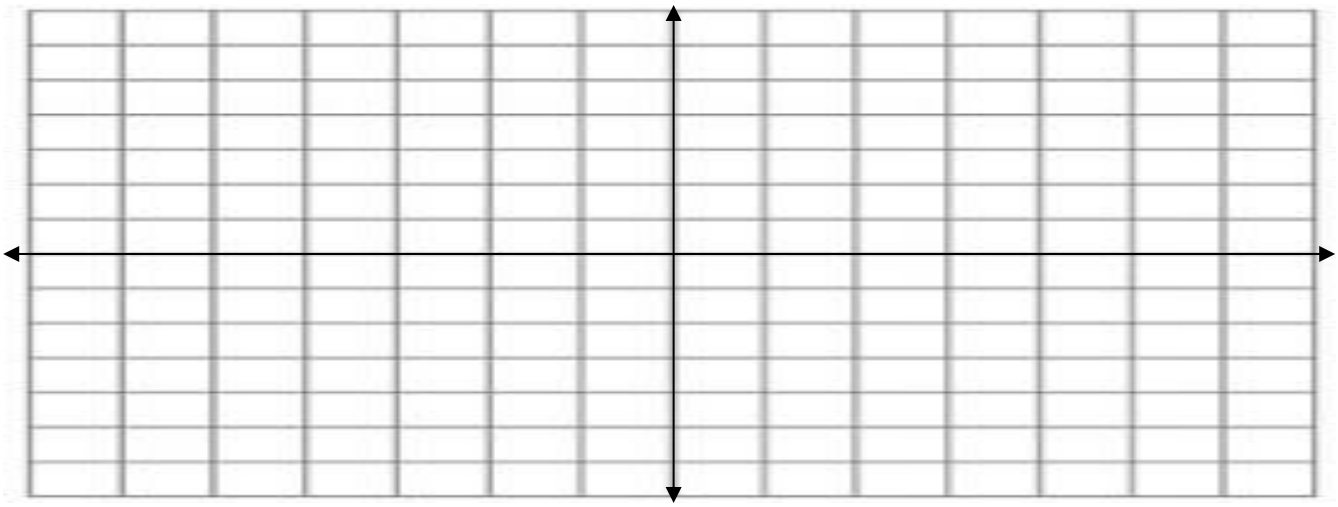
9. Consider that $\sin x = \frac{-\sqrt{3}}{2}$ for the domain $0 \le x \le 2\pi$. **[K – 2, C – 3]**

a) How many solutions are possible?

b) In which quadrants would you find the solutions?

c) Determine all the solutions for the equation in the given domain.

10. Consider the function $f(x) = 8 \sin x \cos x$. Find an equivalent expression in terms of a single trigonometric function, state the amplitude and period, and sketch the graph over the domain $-2\pi \le x \le 2\pi$. **[K – 2, C – 3]**



11. Determine all of the solutions for each equation over the domain of $0 \le \theta \le 2\pi$, leaving your answers in exact form where possible. **[A – 9, C – 3]**

a) $\csc\theta - \sqrt{2} = 0$

b) $2\cos 4\theta = \sqrt{3}$

c) $7\cos\theta = \cos 2\theta - 3$

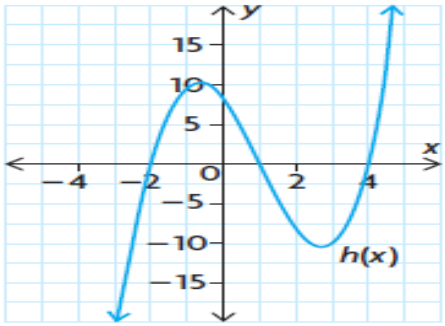
Name: _____

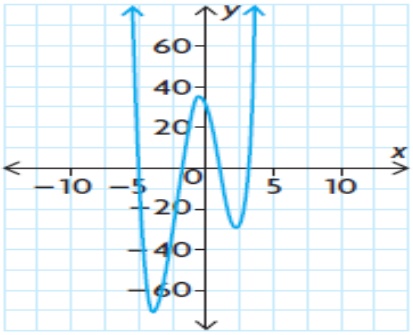
Date: _____

K (30%)	A (30%)	T (20%)	C (20%)
/12	/12	/8	/8

MHF4U Quiz 4A: Chapter 4 **Total Mark: /40**

1. For the functions shown below, state the degree and the roots of the equations and use a point on each of them to solve for each specific equation in **standard** form. [T – 8]





2. The height, width and length of a small box are consecutive integers with the height being the smallest of the three dimensions. If the length and width are increased by 2 cm each and the height is tripled, then the volume of the box is increased by 552 cm^3. Use algebraic techniques to find the dimensions of the original small box. [C – 5]

3. Solve the equation $-4x^4 + 5x^3 = 0$ [C – 3]

4. Graph each solution set given below on a number line. [K – 4]

a) $x < -5$

b) $-4 < x \leq 7$

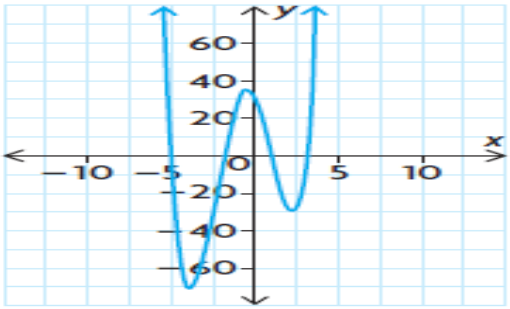
5. Solve each of the following inequalities and show your solutions using both interval notation as well as graphically on a number line. [K – 3, A – 3]

a) $-3(x + 4) < -21$

b) $4(x - 6) + 8 \geq 3 - 3(x - 6)$

6. Solve the inequality $x^2 - x - 6 \leq 0$ algebraically using an interval chart and also sketch a graph of the function to verify your solution. [K – 2, A – 2]

7. Consider the graph of the function shown below. [K – 3, A – 3]



a) Determine an interval where the average rate of change is:

i) Positive ii) Negative iii) Zero

b) Determine a point where the instantaneous rate of change is:

i) Positive ii) Negative iii) Zero

8. The population of a city has been tracked since 1970. The population growth, P(x), is a function of the number of years, x, since 1970. [A – 4]

$P(x) = 3(x - 30)^3 + 30000,\ 0 \leq x \leq 50$

a) At what rate is the population growing between 1996 and 2012?

b) At what rate is the population expected to grow in 2013?

Name: _____

Date: _____

K (30%)	A (30%)	T (20%)	C (20%)
/21	/21	/14	/14

MHF4U Quiz 5A: Chapter 5 **Total Mark: /70**

1. Algebraically find all x-intervals that solve the inequality $\frac{-2x}{x-7} \geq \frac{2}{x-3}$. [A – 4]

2. Re-write the rational inequality $4x-3 < \frac{2x+5}{2x-3}$ as a single equivalent rational expression. [A – 2]

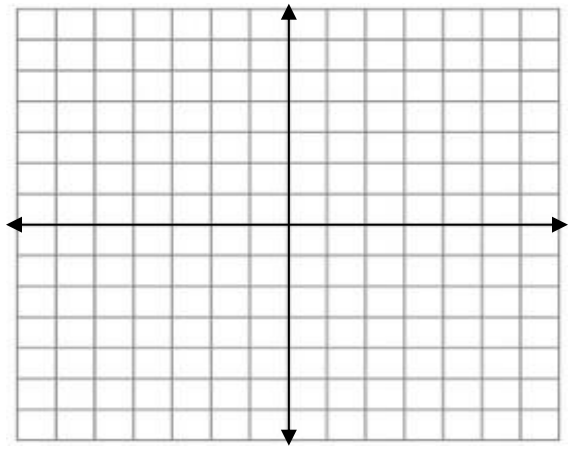
3. State a possible equation of rational function *f(x)* that has $D = \{x \in \mathbf{R} \mid x \neq \frac{3}{4}\}$, x-intercept (1, 0) and *y*-intercept $(0, \frac{2}{3})$. [A – 3]

4. Identify the intervals of increase and decrease for $f(x) = \dfrac{x+6}{x-5}$. [T – 2]

5. Two pipes, A & B, are used to fill the water into the swimming pool of a local park. When the two pipes are running together, the pool is full of water in 75 minutes. When only one pipe is used to fill the pool, pipe A takes 16 minutes longer than pipe B to complete the job. How long does each pipe need to fill the pool when filling it without the other one? [A – 2, C – 2]

6. Estimate the slope of the tangent line to the graph of $f(x) = \dfrac{2x}{2x-3}$ at the point where x = 0 and find the average rate of change for the function over the interval [1, 2]. [K – 4]

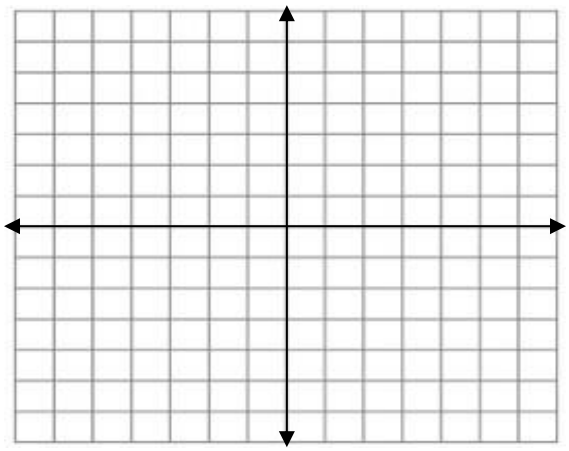
7. Use the key characteristics of reciprocal function $f(x) = \frac{1}{3x-7}$ to sketch its graph. [K – 5, A – 3]

VA:	HA:	x-intercept(s):
End Behaviour:		y-intercept:
Intervals of Increase: Intervals of Decrease:		

8. Show how the characteristics of the graph of $f(x) = -(x + 3)^2 + 2$ enables you to graph the reciprocal function. Be sure to mention the domain & range, x- & y-intercepts, asymptotes, intervals of increase/decrease, positive/negative intervals, co-ordinates of any turning points and points where y = 1 or y = –1 for both functions. [C – 9]

9. State the important information and sketch the function, [K – 6, T – 6]

$$f(x) = \frac{(x-2)(x^2+7x+12)}{(x^2+4x-5)(x+4)}$$

VA:	HA:	x-intercept(s):
End Behaviour:		y-intercept:
Intervals of Increase: Intervals of Decrease:		

10. The Bond Basketball Team bought pizza for $1000 to sell at the game. They kept 20 pizzas to feed the players after the game and sold the rest for $2150. There were 10 slices in each pizza. Their profit was $1/slice. [A – 4, C – 3]

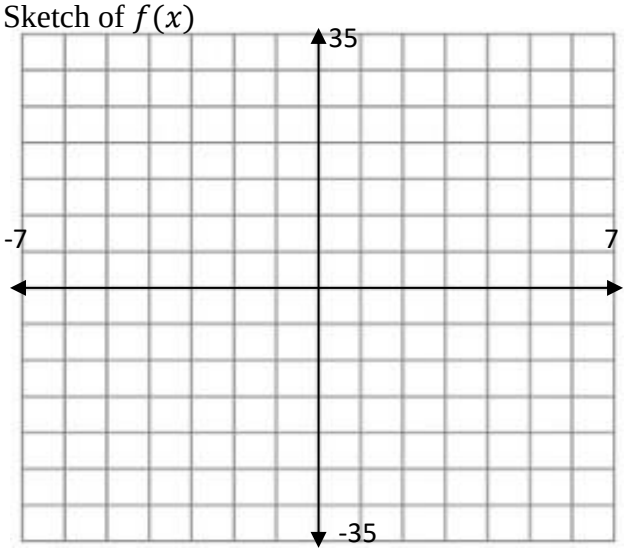
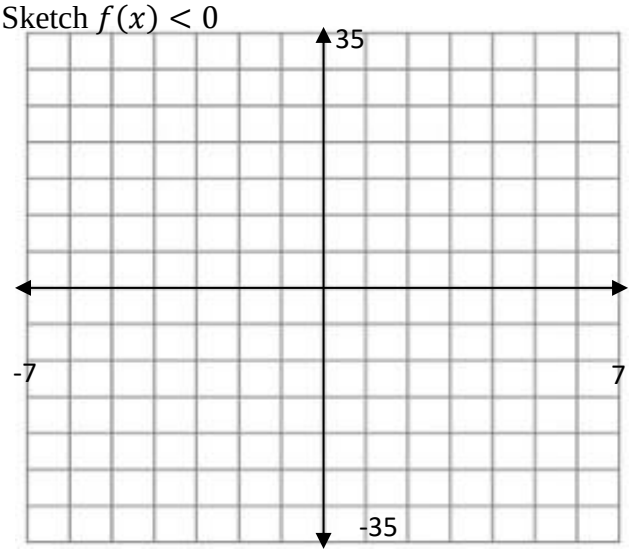
a) How many pizzas were in the original order?

b) What was the original price of each pizza?

c) What did they charge per slice?

11. State the important information and sketch the function, [K – 6, T – 6]

$$f(x) = \frac{(x^2 - 2x - 3)}{x + 2}$$

VA:	Behaviour:	x-intercept(s):
Asymptote:		y-intercept:
Sketch of $f(x)$ 		Sketch $f(x) < 0$ 

12. The reciprocal of a number, decreased by the reciprocal of three times the number, is less than 3. Find the number(s) for which this is true. [A – 3]