NAME:_____ **/ 60 =** **%**

MATH 126 TEST 2 SAMPLE

NOTE: The actual exam will only have 12 questions. The different parts of each question (part A, B, etc.) are variations. Know how to do all the variations on this exam.

1A.) (3 pts) Write a degree 4 polynomial $f(x)$ with a leading coefficient of 1 that has the following zeros: $0, -1, \pm\sqrt{2}$. Leave your answer in factored form.

1A._____

1B.) (3 pts) Write a degree 5 polynomial $f(x)$ with a leading coefficient of 1 that has the following zeros: $-5, -2, 0, 1, 6$ Leave your answer in factored form.

1B._____

2A.) (4 pts) Find the intercepts for: $y = 6x^2 - 11x - 10$
Use any method.

x-int:_____

y-int:_____

2B.) (4 pts) Find the intercepts for: $y = (2-x)^2 - 5$
Use any method.

x-int:_____

y-int:_____

3A.) (4 pts) Solve: $0 = (2x-3)^2 - 9$

3A._____

3B.) (4 pts) Solve: $2x^2 - 8x - 14 = 0$

3B._____

4A.) (3 pts) Simplify: i^{239} 4A._____

4B.) (3 pts) Simplify: i^{108} 4B._____

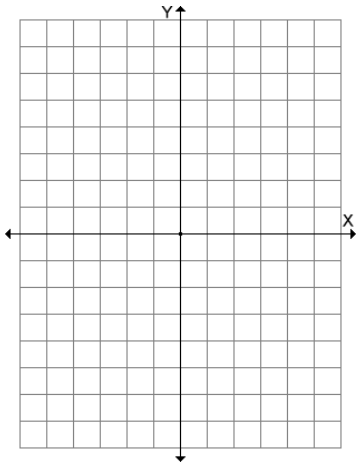
5A.) (4 pts) Divide and write in standard form: $\frac{4+i}{3+5i}$ 5A._____

5B.) (4 pts) Divide and write in standard form: $\frac{52i}{2-3i}$ 5B._____

6A.) (3 pts) Write the expression in terms of i and simplify: $\sqrt{-32}\sqrt{-6}$ 6A._____

6B.) (3 pts) Write the expression in terms of i and simplify: $\sqrt{-40}\sqrt{-5}$ 6B._____

7A.) (8 points) Find the vertex, axis of symmetry, and intercepts for $y = 4x^2 - 12x + 5$ and graph.

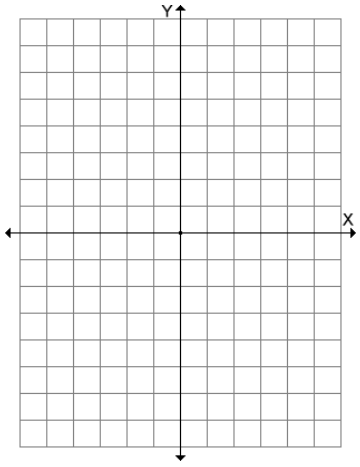


Vertex:_____ axis of symmetry:_____

x-int:_____ y-int:_____

Range:_____

7B.) (8 points) Find the vertex, axis of symmetry, and intercepts for $y = -(x-3)^2 + 4$ and graph.



Vertex:_____ axis of symmetry:_____

x-int:_____ y-int:_____

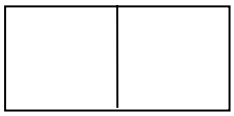
Range:_____

8A.) (5 pts) Among all pair of numbers whose sum is 19, find a pair whose product is as large as possible. What is the maximum product?

Pair:_____

Product:_____

8B.) (5 pts) A rancher with 600 feet of fencing wants to enclose a rectangular horse corral and then divide it into two pens with fencing parallel to one side of the rectangle as shown below.



i.) Find a function, $A(x)$, that models the area of corral in terms of the width x of the corral. i._____

ii.) What is the maximum area that can be enclosed by the corral? ii._____

9A.) (5 pts) The daily revenue, R, achieved by selling x wristwatches is figured to be $R(x) = 75x - 0.2x^2$. The daily cost, C, of selling x wristwatches is $C(x) = 33x - 1750$.

i.) Write a profit function, P, as a function of x. 9i._____

ii.) How many wristwatches must be sold in order to maximize the profit? 9ii._____

iii.) What is the maximum profit? 9iii._____

9B (5 pts) A quarterback throws a football with an initial velocity of 72 ft/sec at an angle of 25°. The height of the ball can be modeled by $h(t) = -16t^2 + 30.4t + 5$, where $h(t)$ is the height (in ft) and t is the time in seconds after release.

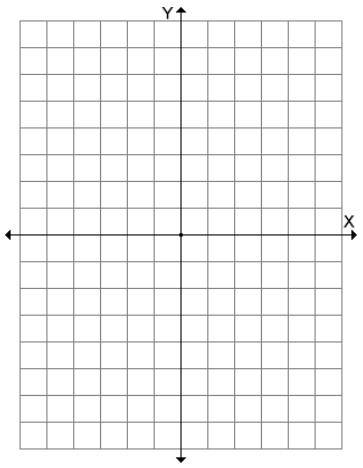
i.) Determine the time at which the ball reaches its maximum height. Round to the nearest hundredth. 9i._____

ii.) Determine the maximum height of the football. Round to the nearest hundredth. 9ii._____

10A.) (4 pts) Solve and write in interval notation: $\frac{(x+4)^2(x-1)}{(x+2)^3} \le 0$ 10A._____

10B.) (4 pts) Solve and write in interval notation: $(x+1)(x-3)^2 > 0$ 10B._____

11A.) (10 pts) Graph $y = 0.2x(x-2)^2(x+2)^3$ Find the intercepts and multiplicities, whether the graph crosses or touches at that zero, max. number of turning pts, and degree. Then find the power function.



zero:_____ Multiplicity:_____ Cross or touch?_____

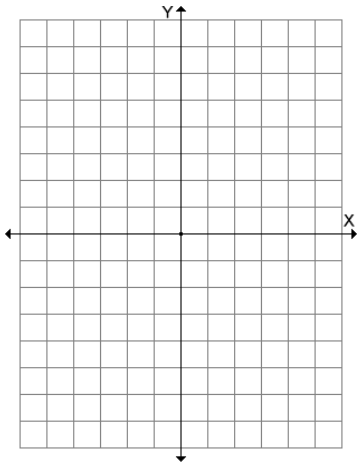
zero:_____ Multiplicity:_____ Cross or touch?_____

zero:_____ Multiplicity:_____ Cross or touch?_____

y-int:_____ Degree:_____ Max turning pts:_____

Determine the end behavior of the graph of the function. The graph of f behaves like $y =$ _____ for large values of $|x|$.

11B.) (10 pts) Graph $y = -(x+1)(x-3)^2$ Find the intercepts and multiplicities, whether the graph crosses or touches at that zero, max. number of turning pts, and degree. Then find the power function.



zero:_____ Multiplicity:_____ Crosses or touches?_____

zero:_____ Multiplicity:_____ Crosses or touches?_____

y-int:_____ Degree:_____ Max turning pts:_____

Determine the end behavior of the graph of the function. The graph of f behaves like $y =$ _____ for large values of $|x|$.

12A.) (7 pts) Given $f(x) = 3x^3 - 23x^2 + 31x + 13$ and $f\left(-\frac{1}{3}\right) = 0$, answer the following:

i.) Use the Rational Zero Theorem to find the list of possible zeros. i._____

ii.) Use SYNTHETIC DIVISION to find the other zeros. ii._____

iii.) Use the zeros to factor $f(x)$. iii._____

12B.) (7 pts) Given $f(x) = 6x^4 - 5x^3 - 15x^2 + 4$ and $f(-1) = 0$ and $f\left(\frac{1}{2}\right) = 0$, answer the following:

i.) Use the Rational Zero Theorem to find the list of possible zeros. i._____

ii.) Use SYNTHETIC DIVISION to find the other zeros. ii._____

iii.) Use the zeros to factor $f(x)$. iii._____