Name: _____ Date: _____

Regents Review Day 5: Exponential Functions & Polynomials

1.
The growth of a certain organism can be modeled by $C(t) = 10(1.029)^{24t}$, where $C(t)$ is the total number of cells after t hours. Which function is approximately equivalent to $C(t)$?

1) $C(t) = 240(.083)^{24t}$
2) $C(t) = 10(.083)^{t}$
3) $C(t) = 10(1.986)^{t}$
4) $C(t) = 240(1.986)^{\frac{t}{24}}$

2.
Anne invested $1000 in an account with a 1.3% annual interest rate. She made no deposits or withdrawals on the account for 2 years. If interest was compounded annually, which equation represents the balance in the account after the 2 years?

1) $A = 1000(1-0.013)^2$
2) $A = 1000(1+0.013)^2$
3) $A = 1000(1-1.3)^2$
4) $A = 1000(1+1.3)^2$

1.3%
.013

3.
Milton has his money invested in a stock portfolio. The value, $v(x)$, of his portfolio can be modeled with the function $v(x) = 30{,}000(0.78)^x$, where x is the number of years since he made his investment. Which statement describes the rate of change of the value of his portfolio?

1) It decreases 78% per year.
2) It decreases 22% per year.
3) It increases 78% per year.
4) It increases 22% per year.

4.
Which ordered pair would *not* be a solution to $y = x^3 - x$?

1) $(-4,-60)$
2) $(-3,-24)$
3) $(-2,-6)$
4) $(-1,-2)$

NORMAL FLOAT AUTO REAL RADIAN MP
PRESS + FOR △Tbl

X	Y1
-7	-336
-6	-210
-5	-120
-4	-60
-3	-24
-2	-6
-1	0
0	0
1	0
2	6
3	24

X= -7

$x^2 + x^3 + x \rightarrow x^3 + x^2 + x$

5.
Write the expression $5x + 4x^2(2x+7) - 6x^2 - 9x$ as a polynomial in standard form.

$5x + 4x^2(2x+7) - 6x^2 - 9x$
$5x + 8x^3 + 28x^2 - 6x^2 - 9x$
$8x^3 + 22x^2 - 4x$

6.
The expression $3(x^2-1) - (x^2 - 7x + 10)$ is equivalent to

1) $2x^2 - 7x + 7$
2) $2x^2 + 7x - 13$
3) $2x^2 - 7x + 9$
4) $2x^2 + 7x - 11$

$3x^2 - 3 - x^2 + 7x - 10$
$2x^2 + 7x - 13$

$y = 10(1.40)^x$

$y = 20(1.06)^x$

$y = 30(.90)^x$

$y = 60(.75)^x$

$x^2 - 4$

$(x+2)(x-2)$

solutions
x-intercepts
roots

7. DOTS!

The expression $49x^2 - 36$ is equivalent to

1) $(7x-6)^2$
2) $(24.5x-18)^2$
3) $(7x-6)(7x+6)$
4) $(24.5x-18)(24.5x+18)$

$(7x+6)(7x-6)$

8.

The zeros of the function $f(x) = x^2 - 5x - 6$ are

1) -1 and 6
2) 1 and -6
3) 2 and -3
4) -2 and 3

AM

$x^2 - 5x - 6 = 0$

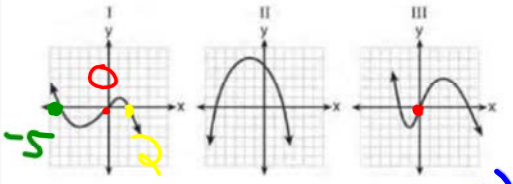
$(x-6)(x+1) = 0$

$x-6=0$ $x+1=0$

$x=6$ $x=-1$

9.

A polynomial function contains the factors x, $x-2$, and $x+5$. Which graph(s) below could represent the graph of this function?



1) I, only
2) II, only
3) I and III
4) I, II, and III

$x(x-2)(x+5)=0$

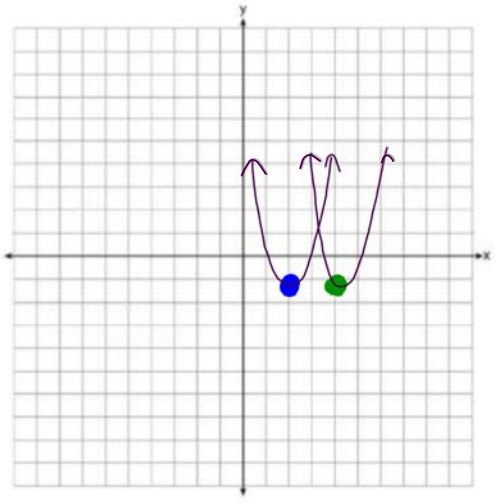
$x=0$ $x=2$ $x=-5$

10.

If the original function $f(x) = 2x^2 - 1$ is shifted to the left 3 units to make the function $g(x)$, which expression would represent $g(x)$?

1) $2(x-3)^2 - 1$
2) $2(x+3)^2 - 1$
3) $2x^2 + 2$
4) $2x^2 - 4$

The vertex of the parabola represented by $f(x) = x^2 - 4x + 3$ has coordinates $(2,-1)$. Find the coordinates of the vertex of the parabola defined by $g(x) = f(x-2)$. Explain how you arrived at your answer. [The use of the set of axes below is optional.]



$(2,-1)$

↓

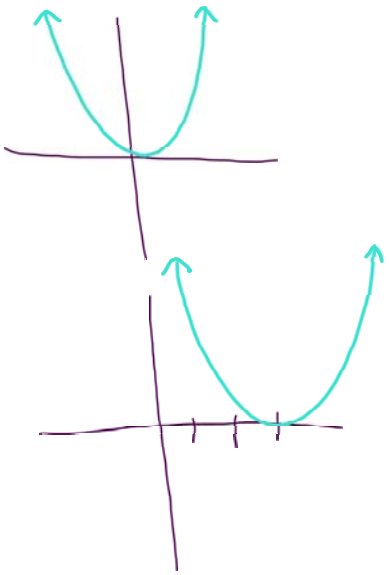
$(4,-1)$

x^2

$(x-3)^2$

x^2+2

x^2-4



Homework/Practice Questions

1.

The equation $A = 1300(1.02)^7$ is being used to calculate the amount of money in a savings account. What does 1.02 represent in this equation?

1) 0.02% decay
2) 0.02% growth
3) 2% decay
4) 2% growth

2.

Which expression is equivalent to $2(3g-4)-(8g+3)$?

1) $-2g-1$
2) $-2g-5$
3) $-2g-7$
4) $-2g-11$

3.

Determine all the zeros of $m(x) = x^2 - 4x + 3$, algebraically.

4.

Given the graph of the line represented by the equation $f(x) = -2x + b$, if b is increased by 4 units, the graph of the new line would be shifted 4 units

1) right
2) up
3) left
4) down

5.

The table below shows the temperature, $T(m)$, of a cup of hot chocolate that is allowed to chill over several minutes, m.

Time, m (minutes)	0	2	4	6	8
Temperature, T(m) (°F)	150	108	78	56	41

Which expression best fits the data for $T(m)$?

1) $150(0.85)^m$
2) $150(1.15)^m$
3) $150(0.85)^{m-1}$
4) $150(1.15)^{m-1}$