

NAME:

SEMESTER 1 EXAM STUDY GUIDE

UNIT 6 – EXPONENTS

Objective: Simplify Exponents using Exponent Properties.

$$x^a \cdot x^b = x^{a+b}$$

ex. $y^3 \cdot y^8 =$

$$(x^m)^n = x^{mn}$$

ex. $(x^4)^3 =$

$$(x \cdot y)^a = x^a \cdot y^a$$

ex. $(k \cdot j)^3 =$

$$x^0 = 1$$

ex. $(a^3 b^2)^0 =$

$$x^{-a} = \frac{1}{x^a}$$

ex. $2^{-3} =$

$$\frac{x^a}{x^b} = x^{a-b}$$

ex. $\frac{b^3}{b^{-5}} =$

$$\left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$$

ex. $\left(\frac{3}{b}\right)^2 =$

Objective: Simplify Exponents using Exponent Properties.

1) $\frac{6^7}{6^2} =$

2) $\frac{x^9}{x^{11}} =$

3) $\frac{(7xy^2)^4}{y^{10}x} =$

4) $(4 \cdot 9)^0 =$

5) $(k^4)^8 =$

6) $\frac{b^3}{5a^{-10}b^{-1}} =$

7) $(3a)^3 \cdot (2a)^2 =$

8) $7x^{-3}y =$

9) $\frac{m^7}{3n^4} \cdot \frac{3m^2n^2}{mn} =$

10) $\frac{y^2}{y^{-10}}$

11) $\frac{x^{-4}y^{12}}{y^{15}x^{-13}}$

12) $(2x)^{-3} \cdot x^3$

13) $(3^3x^2y)^4 \cdot x^5y^6$

14) $4c(-3c^2)^2 25x^3 - 12$

15) $(2ac^2)^3(a^2c)^0(ac)^3$

Objective: Given a table, state if the function is linear or exponential.

16)

X	-2	-1	0	1	2	3
Y	3	5	7	9	11	13

17)

x	-2	-1	0	1	2	3
y	1	2	4	8	16	32

Objective: Given an equation, state if it models exponential growth, exponential decay, or neither.

18)

a) $y = 3 \cdot \left(\frac{1}{2}\right)^x$ b) $y = 7^x$ c) $y = 9x^2$ d) $y = \frac{1}{3}^x$

Objective: Graph an exponential function. State the Domain, Range, and End Behavior.

19) Complete the table and graph the exponential function.

$y = 4^x$

x	-2	-1	0	1	2	3
y						

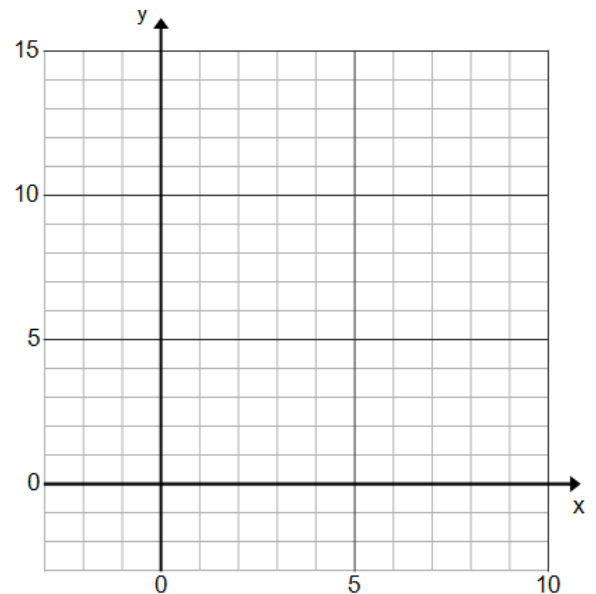
Domain: _____

Range: _____

End Behavior:

As $x \rightarrow -\infty$, $y \rightarrow$ _____

As $x \rightarrow \infty$, $y \rightarrow$ _____



Objective: Solve real-life problems involving exponential growth and decay.

MEMORIZE THE FOLLOWING!!!!

Growth Formula : $y=C(1+r)^t$

Decay formula: $y=C(1-r)^t$

C = initial amount

r = growth rate

t = time

y = final amount

20) You deposit \$500 in a bank account that pays 8% annual interest compounded yearly. What is the account balance after 6 years?

21) You buy a computer for \$3,000 that **depreciates** at a rate of 20% per year. Find the value of the computer after 5 years.

22) The concentration of aspirin in a person's bloodstream decreases by 20% each hour after taking a dose. If a person took 250 mg 6 hours ago, how much aspirin is left in his bloodstream now?

UNIT 7 – POLYNOMIALS

Objective: Classify Polynomials by Degree and Number of Terms

23) $25x^3 - 12$

24) $25x^3 - 2x^2 + 12$

25) $-2x^4$

26) -300

Objective: Add/Subtract Polynomials

$$27) (5x^3 - 2x + x^2 + 7) + (3x^2 + 7 - 4x) =$$

$$28) (-2x^4 + 6x^2 + 5) - (-2x^4 + 5x^2 - 1 - x) =$$

Objective: Multiply Polynomials

$$29) (x - 3)(x + 7) =$$

$$30) (3y + 8)(2y - 1) =$$

$$31) 3x^2(4x - 2 + x^3) =$$

$$32) (y - 2)(2y^2 + 4y - 1)$$

Objective: Multiply Special Product Polynomials

$$33) (2x + 3)^2 =$$

$$34) (x + 5)(x - 5) =$$

Objective: Factor using GCF

35) $2x^4 - 4x$

36) $6x^2 + 9x^3$

37) $4y^3 - 16y^5$

Objective: Factor and Solve with a = 1

38) $x^2 + x - 12 = 0$

39) $x^2 - 13x + 42 = 0$

40) $y^2 + 23y - 24 = 0$

Objective: Factor and Solve with a ≠ 1

41) $2x^2 + 7x - 15 = 0$

42) $3x^2 - 10x - 8 = 0$

43) $5x^2 + 33x - 14 = 0$

Objective: Factor and Solve using DOTS

44) $x^2 - 64 = 0$

45) $4x^2 - 81 = 0$

46) $x^2 - 121 = 0$

Objective: Use Zero Product Property

47) $(2x + 1)(x - 3) = 0$

48) $3x(x + 5) = 0$

49) $(x - 1)(3x + 2) = 0$

UNIT 8 – QUADRATICS

Objective: Graphing Quadratics using Transformations.

50) Describe how the parent function is being transformed.

$$y = 3x^2$$

$$y = (x - 6)^2 - 2$$

$$y = -(x)^2 - 10$$

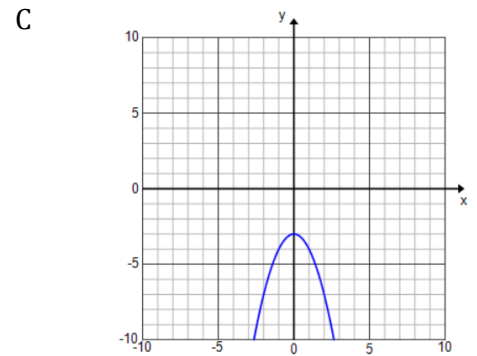
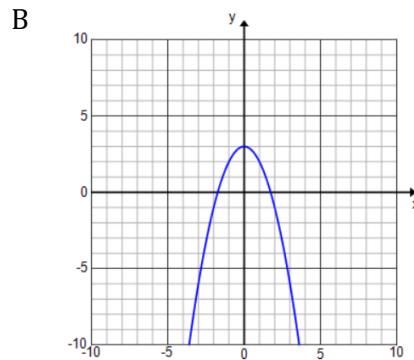
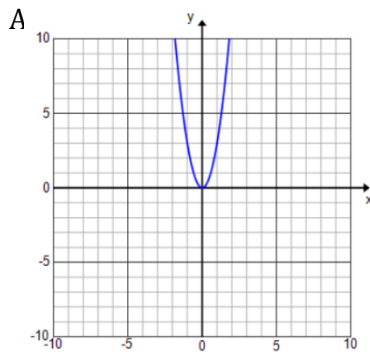
$$y = (-x)^2 + 12$$

Match the transformed function with its graph.

51. $y = -x^2 + 3$ _____

52. $y = -x^2 - 3$ _____

53. $y = 3x^2$ _____



Objective: Graphing Quadratics using Vertex Form.

Find the vertex and axis of symmetry of the graphs of the following functions.

54. $y = 2(x - 3)^2 + 4$

55. $y = 6(x + 1)^2 - 5$

56. $y = -(x + 5)^2$

Do the following graphs open up or down?

57. $y = -2x^2 - 3x$

58. $y = 5x + 10x^2$

59. $y = 5 - 2x^2 + 8x$

60. $y = -(x + 3)^2 - 4$

61. $y = 2(x + 6)^2 - 4$

62. $y = 3(x - 2)^2 + 10$

Graph the following quadratic equations in vertex form with at least five accurate points.

6. $y = (x-3)^2 - 1$

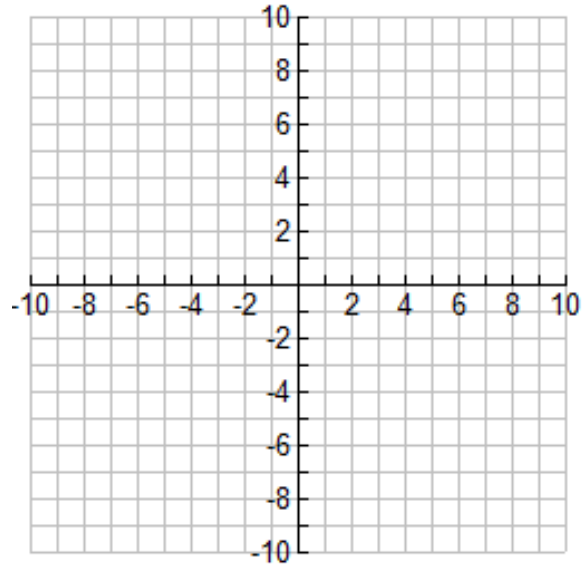
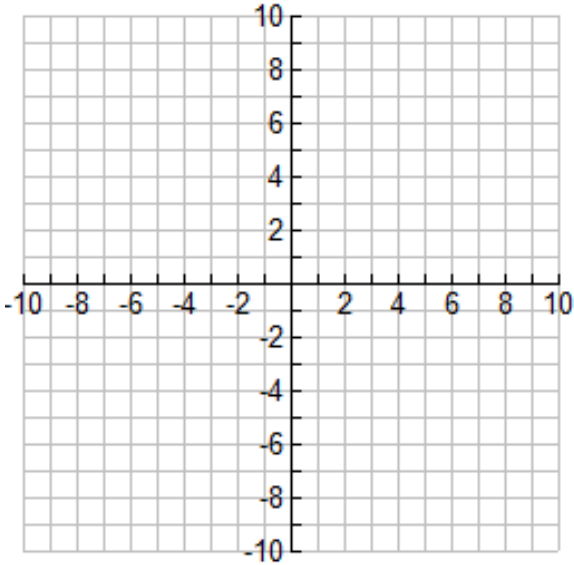
Vertex: _____

Pattern: _____

7. $y = 2(x+1)^2 - 8$

Vertex: _____

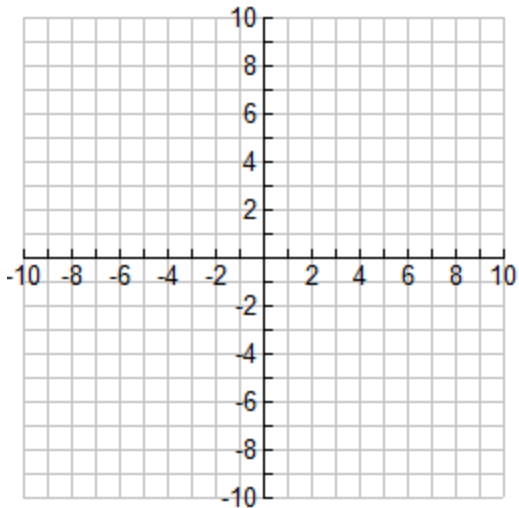
Pattern: _____



Objective: Graphing Quadratics using Standard Form.

Graph the following quadratic equations and state the vertex, axis of symmetry and y-intercept of each.

$y = x^2 - 8x + 9$



$y = -x^2 - 4x + 2$

