

Sample Final II

Date _____ Period _____

Find the term named in the problem.

1) 15, 25, 35, 45, ...

Find a_{34}

A) $a_{34} = 347$

B) $a_{34} = 359$

*C) $a_{34} = 345$

D) $a_{34} = 357$

Find the explicit formula.

2) 26, 29, 32, 35, ...

A) $a_n = 24 + 3n$

B) $a_n = 22 + 5n$

C) $a_n = 29 - 3n$

*D) $a_n = 23 + 3n$

Find the term named in the problem.

3) 2, 4, 8, 16, ...

Find a_{11}

A) $a_{11} = 3072$

B) $a_{11} = 177147$

*C) $a_{11} = 2048$

D) $a_{11} = -531441$

Find the explicit formula.

4) 2, -12, 72, -432, ...

A) $a_n = 2 \cdot 5^{n-1}$

B) $a_n = 11 \cdot 5^{n-1}$

C) $a_n = 10 \cdot 5^{n-1}$

*D) $a_n = 2 \cdot (-6)^{n-1}$

Simplify. Your answer should contain only positive exponents.5) $y^3 \cdot 3x^4 y^3$

A) $\frac{8x^6}{y^4}$

B) $\frac{8}{x^8 y}$

C) $\frac{9}{x^2 y^3}$

*D) $3y^6 x^4$

6) $\frac{2xy^{-3}}{3x}$

A) $\frac{2x}{y^2}$

*B) $\frac{2}{3y^3}$

C) $\frac{3y^4}{2x^4}$

D) $\frac{1}{4}$

7) $(x^4)^2$

A) $27x^9$

B) $64y^3x^9$

*C) x^8

D) $\frac{1}{4x^4}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

8) $(xy)^{\frac{3}{4}}$

A) $\frac{x^{\frac{1}{4}}y^{\frac{3}{8}}}{xy}$

*B) $x^{\frac{3}{4}}y^{\frac{3}{4}}$

C) $\frac{x^{\frac{1}{6}}y^{\frac{1}{2}}}{xy^3}$

D) $\frac{y^{\frac{1}{3}}}{y}$

9) Which of the following represents exponential growth?

*A) $y = 2 \cdot 1.5^x$

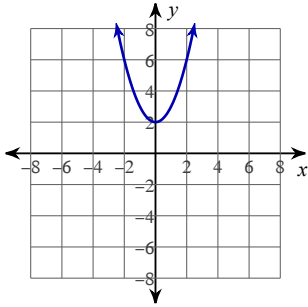
B) $y = 4 \cdot 0.5^x$

C) $y = 200(1 - 0.5)^x$

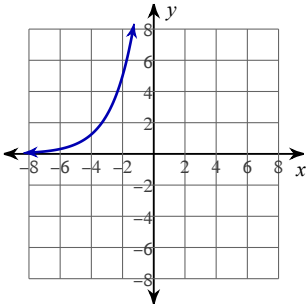
D) $y = 0.2^x$

10) Which of the following represents exponential decay?

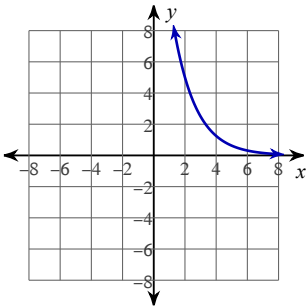
A)



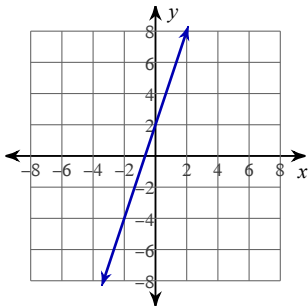
B)



*C)



D)



Write each expression in radical form.

11) $(7a)^{\frac{3}{2}}$

A) $\sqrt{7a}$

*B) $(\sqrt{7a})^3$

C) $(\sqrt{a})^5$

D) $(\sqrt[3]{2a})^5$

Simplify.

12) $(v^6)^{\frac{1}{2}}$

A) $6v^3$

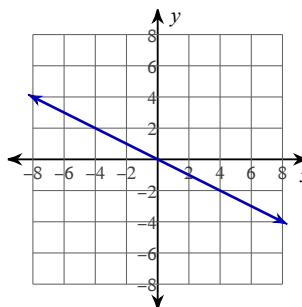
B) $16v^6$

C) $8v$

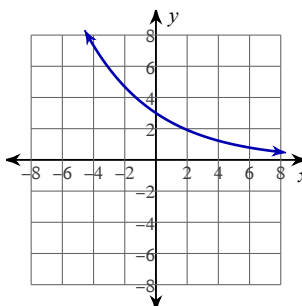
*D) v^3

13) Match the function with the graph: $y = 2^x$

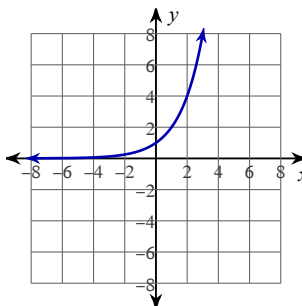
A)



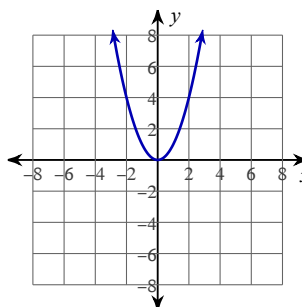
B)



*C)



D)



14) Which function represents the following scenario: An item costs \$4.50, and its price increases by 3.5% each year.

A) $y = 4.5(1 - 0.035)^t$

*B) $y = 4.5(1 + 0.035)^t$

C) $y = 4.5(1 + 0.35)^t$

D) $y = 4.5 \cdot 1.035t$

Simplify each sum.

15) $(6 - 2r^3 - 2r^2) + (3r^3 - 5r^2 - 6)$

*A) $r^3 - 7r^2$

B) $r^3 - 6r^2 - 3$

C) $r^3 - 5r^2$

D) $r^3 - 6r^2$

Simplify each difference.

16) $(7k + 5k^2 + 5) - (2 - 8k^3 - 5k^2)$

- A) $9k^3 + 9k^2 + 7k + 3$
- *B) $8k^3 + 10k^2 + 7k + 3$
- C) $9k^3 + 9k^2 + 10k + 3$
- D) $9k^3 + 10k^2 + 7k + 3$

Find each product.

17) $(8b - 6)(7b - 5)$

- A) $56b^2 - 2b - 30$
- *B) $56b^2 - 82b + 30$
- C) $8b^2 - 56b - 64$
- D) $56b^2 + 30$

18) $(2n + 8)(n^2 + 5n - 1)$

- A) $48n^3 + 10n^2 - 66n + 8$
- B) $8n^3 - 18n^2 + 30n + 36$
- C) $5n^3 - 22n^2 + 10n + 15$
- *D) $2n^3 + 18n^2 + 38n - 8$

19) $(4b - 8)^2$

- A) $16b^2 - 64$
- *B) $16b^2 - 64b + 64$
- C) $4b + 64$
- D) $16b^2 + 64$

20) $(6n + 2)(6n - 2)$

- A) $36n^2 + 24n + 4$
- B) $16n^2 - 16$
- *C) $36n^2 - 4$
- D) $16n^2 - 32n + 16$

Solve each equation by factoring.

21) $(k - 6)(7k - 4) = 0$

- A) $\{2, 6\}$
- B) $\{-8, 4\}$
- C) $\left\{\frac{7}{5}, -\frac{4}{7}\right\}$
- *D) $\left\{6, \frac{4}{7}\right\}$

Factor each completely.

22) $a^4 + 2a^2 - 3$

- A) $(a^2 + 8)(a^2 - 6)$
- *B) $(a - 1)(a + 1)(a^2 + 3)$
- C) $(a^2 - 3)(a - 1)(a + 1)$
- D) $(a^2 + 3)(a^2 + 1)$

23) $6a^2 + 42a - 108$

- A) $6(a + 18)(a - 1)$
- B) $(a - 2)(a + 9)$
- C) $6(a + 2)(a - 9)$
- *D) $6(a - 2)(a + 9)$

24) $5x^2 + 24x - 36$

- *A) $(5x - 6)(x + 6)$
- B) $(2x + 9)(x - 1)$
- C) $(5x + 6)(x + 6)$
- D) $(5x + 6)(x - 6)$

Solve each equation by factoring.

25) $a^2 + a = 0$

- A) $\{8, 7\}$
- *B) $\{-1, 0\}$
- C) $\{-1, -7\}$
- D) $\{-2, -3\}$

Factor each completely.

26) $9m^2 - 16$

- A) $(m + 1)(m - 1)$
- B) $(2m + 1)(2m - 1)$
- *C) $(3m + 4)(3m - 4)$
- D) $(5m + 3)(5m - 3)$

27) $9k^2 + 12k + 4$

- A) $(4k - 1)^2$
- *B) $(3k + 2)^2$
- C) $(3k + 5)^2$
- D) $(-3k + 2)(3k + 2)$

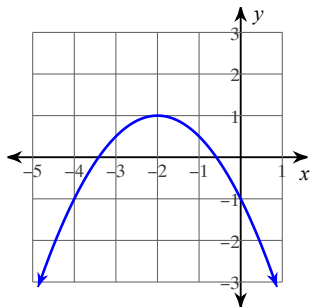
28) $x^4 - 13x^2 + 40$

- A) $(x^2 + 10)(x^2 + 4)$
- *B) $(x^2 - 5)(x^2 - 8)$
- C) $(x^2 + 20)(x^2 - 2)$
- D) $(x^2 + 5)(x^2 + 8)$

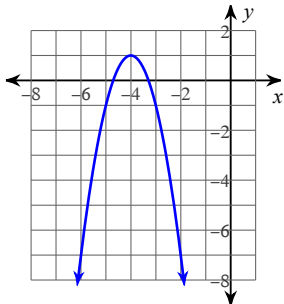
Sketch the graph of each function.

29) $y = -x^2 - 2x - 5$

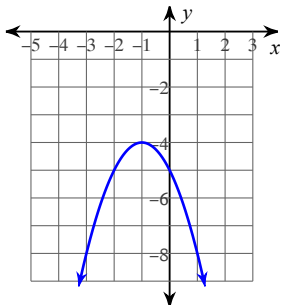
A)



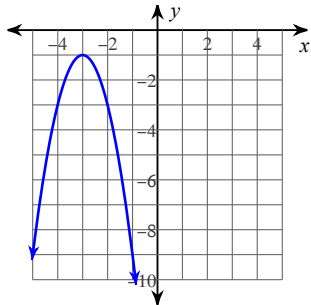
B)



*C)



D)



30) A firework is launched into the air from a height of 3 feet with an upward velocity of 100 ft per second. Its height, h , (in feet) after t seconds is given by the function $h(t) = -16t^2 + 100t + 3$. How high is the firework at 3 seconds?

- A) 3 ft B) 100 ft
 C) Back on the ground *D) 159 ft

31) A firework is launched into the air from a height of 3 feet with an upward velocity of 100 ft per second. Its height, h , (in feet) after t seconds is given by the function $h(t) = -16t^2 + 100t + 3$. After how many seconds does the ball reach its maximum height? What is the maximum height?

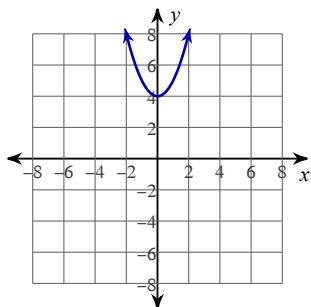
- A) 3 sec; 150 ft
- B) 2.578 sec; 167.28 ft
- *C) 3.13 sec; 159.3 ft
- D) 2.125 sec; 127.25 ft

32) State the domain and range of the function $f(x) = 3^x$

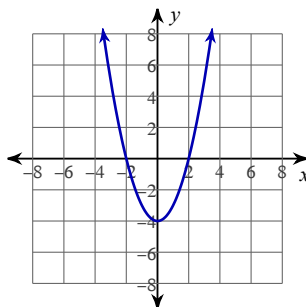
- A) Domain: All real numbers; Range: $y > 0$
- B) Domain: All real numbers; Range: $y \leq 0$
- C) Domain: All real numbers; Range: $y < 0$
- *D) Domain: All real numbers; Range: $y \geq 0$

33) Which graph below is the graph of the function $y = x^2 - 4$? What are the solutions (zeros) of the function $y = x^2 - 4$?

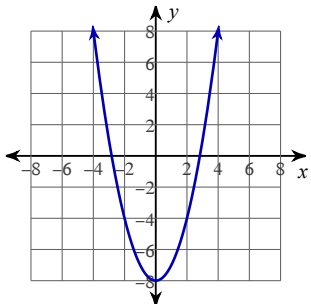
A) There are two solutions: 2 and -2



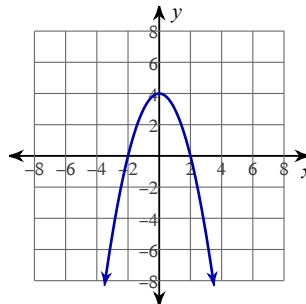
*B) There are two solutions: 2 and -2



C) There are two solutions: $\sqrt{8}$ and $-\sqrt{8}$



D) There are two solutions: 2 and -2



34) Compare the graph of $g(x) = \frac{1}{2}x^2 - 1$ to the graph of $f(x) = x^2$

- A) $g(x)$ is wider than $f(x)$, translated up 1 unit.
- *B) $g(x)$ is wider than $f(x)$, translated down 1 unit.
- C) $g(x)$ is narrower than $f(x)$, translated down 1 unit.
- D) $g(x)$ is narrower than $f(x)$, translated up 1 unit.

35) How can the graph of $g(x) = x^2 - 5$ be obtained from the graph of $f(x) = x^2$

- A) by translating $f(x)$ right 5 units
- B) by translating $f(x)$ left 5 units
- C) by translating $f(x)$ up 5 units
- *D) by translating $f(x)$ down 5 units

36) Does $f(x) = 5x^2 + 6x - 2$ have a maximum or a minimum? Find the value?

- A) Minimum; -1.6 B) Maximum; 1.6
*C) Minimum; -0.6 D) Maximum; 0.6

37) Which quadratic function has a vertex (4, -1)?

- A) $x^2 + 8x + 15$ B) $x^2 - 3x + 4$
C) $x^2 - 5x + 4$ *D) $x^2 - 8x + 15$

38) Which quadratic function has zeros of -3 and 6?

- A) $x^2 - 3x - 6$ *B) $x^2 - 3x - 18$
C) $3(x^2 - 3x - 18)$ D) $x^2 - 3x + 6$