



FRANKLIN LEARNING CENTER

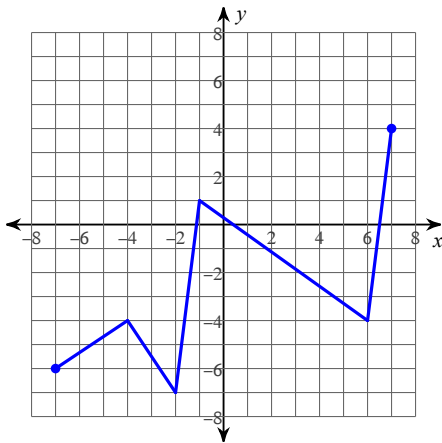
**616 N 15th St
Philadelphia, PA 19130**

SUMMER WORK PACKAGE

**Multiple-choice questions
designed for Algebra 2 graduates.**

The graph represents a relation. Determine if the relation is a function. Then find the domain and range.

1)



- | | |
|---|---|
| A) The relation is a function.
Domain: $-6 \leq x \leq 6$
Range: $-5 \leq y \leq 6$ | B) The relation is a function.
Domain: $-6 \leq x \leq 7$
Range: $-7 \leq y \leq 7$ |
| C) The relation is a function.
Domain: $-7 \leq x \leq 7$
Range: $-7 \leq y \leq 4$ | D) The relation is a function.
Domain: $-7 \leq x \leq 6$
Range: $-5 \leq y \leq 2$ |

Evaluate the geometric series described.

2) $-1 - 2 - 4 - 8 \dots, n = 9$

Solve the equation. Remember to check for extraneous solutions.

3) $\sqrt{12 - 2x} = x - 2$

- A) $\{-8, -1\}$ B) $\{4\}$ C) $\{-8, -2\}$ D) $\{-8\}$

Identify the points of discontinuity, vertical asymptotes, x-intercepts, and horizontal asymptote of the function.

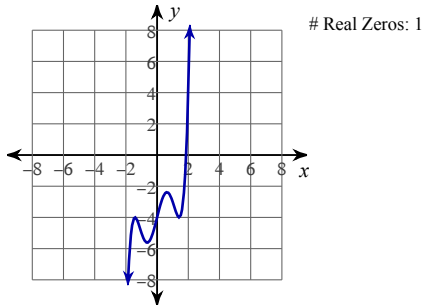
4) $f(x) = \frac{x^2 - 16}{2x^2 + 4x - 16}$

- | | |
|--|---|
| A) Discontinuities: $-4, 4$
Vertical Asym.: $x = 4, x = -4$
Horz. Asym.: $y = 0$
X-intercepts: None | B) Discontinuities: $-4, 2$
Vertical Asym.: $x = 2$
Horz. Asym.: $y = \frac{1}{2}$
X-intercepts: 4 |
| C) Discontinuities: $-4, 4$
Vertical Asym.: $x = 4$
Horz. Asym.: $y = 2$
X-intercepts: 2 | D) Discontinuities: $-4, 2$
Vertical Asym.: $x = 2, x = -4$
Horz. Asym.: $y = 0$
X-intercepts: None |

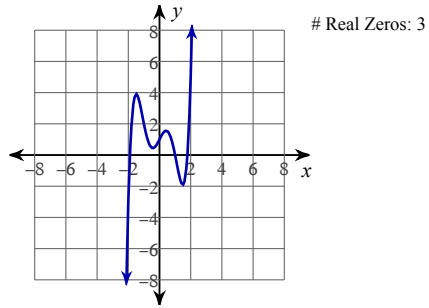
Sketch the graph of the function. State the number of real zeros.

5) $f(x) = x^5 - 4x^3 + x$

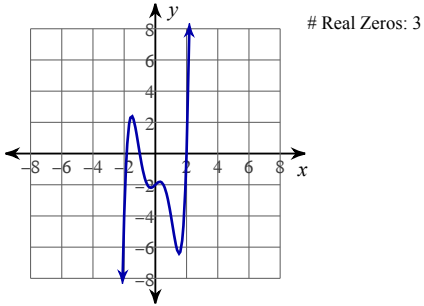
A)



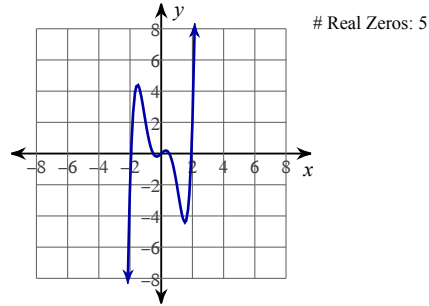
B)



C)



D)



Simplify the expression.

6) $\frac{x-1}{x+5} \div \frac{4x-4}{3x}$

A) $\frac{x-6}{x-9}$

B) $\frac{8}{3x}$

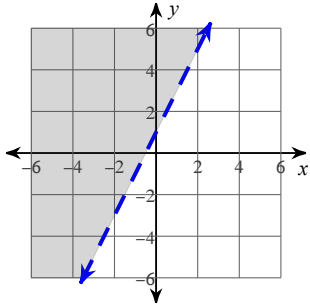
C) $\frac{9x^2}{x-3}$

D) $\frac{3x}{4(x+5)}$

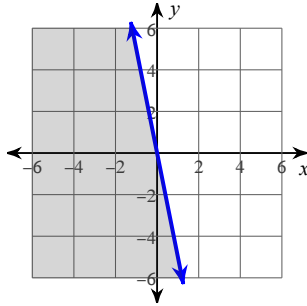
Sketch the graph of the linear inequality.

7) $y \geq -2x + 1$

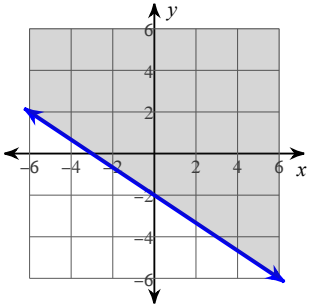
A)



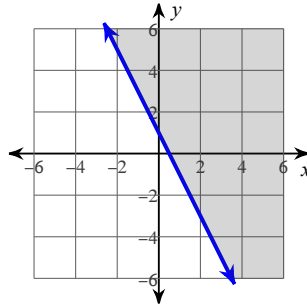
B)



C)



D)



Find all roots.

8) $x^3 - 4x^2 - 2x + 8 = 0$

A) $\{-2, \sqrt{2}, -\sqrt{2}\}$

B) $\{4, i\sqrt{3}, -i\sqrt{3}\}$

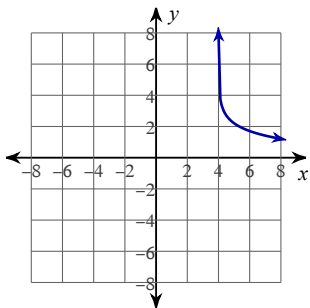
C) $\{4, 1, -1\}$

D) $\{4, \sqrt{2}, -\sqrt{2}\}$

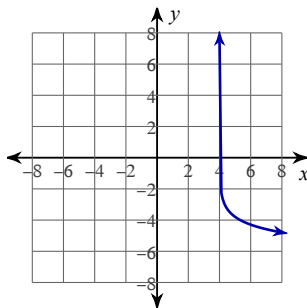
Sketch the graph of the function.

9) $y = \log_{\frac{1}{4}}(3x + 12) - 3$

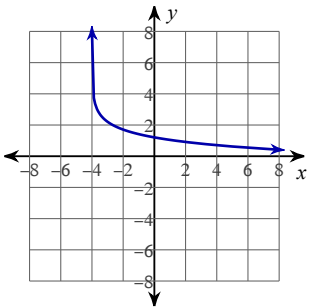
A)



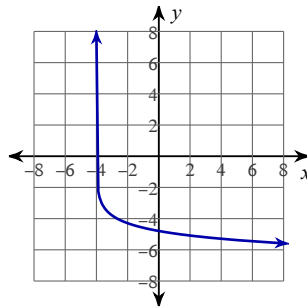
B)



C)



D)



Solve the equation.

10) $-12(x - 3) + 4(x + 12) = -5x + 9x$

- A) $\{-10\}$ B) $\{13\}$ C) $\{7\}$ D) $\{12\}$

11) $9^{-2n} \cdot 27^{-n} = \frac{1}{27}$

- A) $\left\{\frac{3}{7}\right\}$ B) $\left\{-\frac{5}{3}\right\}$ C) $\{6\}$ D) $\{-10\}$

Find each term described.

12) 3rd term in expansion of $(v + 5u)^3$

- A) $15v^2u$ B) $25vu^2$ C) $125u^3$ D) $75vu^2$

Solve the question. Round your answer to the nearest hundredth.

13) It takes Stefan ten minutes to sweep a porch. Sarawong can sweep the same porch in 14 minutes. Find how long it would take them if they worked together.

- A) 7.05 minutes B) 5.29 minutes C) 6.07 minutes D) 5.83 minutes

Evaluate the function.

14) $g(t) = -4^{-t} - 1$; Find $g(4n)$

- A) $-4^{4n} - 1$ B) $-4^{2n} - 1$ C) $\frac{-4^{2n} - 1}{4^{2n}}$ D) $\frac{-4^{4n} - 1}{4^{4n}}$

Solve the discrete exponential growth or decay problem.

15) A company promises to release a new smartphone model every month. Each model's battery life will be 6% longer than the previous model's. If the current model's battery life is 749.0 minutes, what will the latest model's battery life be 10 months from now?

- A) $749 \cdot 1.02^{10} \approx 913.0$ minutes B) $749 \cdot 1.24^{10} \approx 6,437.2$ minutes
C) $749 \cdot 1.12^{10} \approx 2,326.3$ minutes D) $749 \cdot 1.06^{10} \approx 1,341.3$ minutes

Determine if the sequence is arithmetic. If it is, find the explicit formula.

16) 11, -189, -389, -589, ...

- A) $a_n = 211 - 200n$ B) $a_n = 210 - 199n$
 C) $a_n = -186 + 197n$ D) $a_n = -188 + 199n$

Find the absolute value of the complex number.

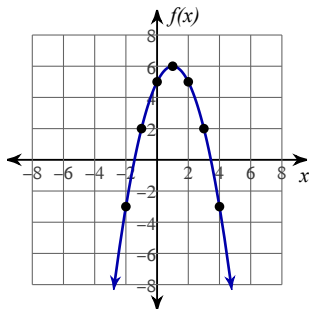
17) $|8 + 7i|$

- A) $\sqrt{65}$ B) $2\sqrt{7}$ C) $\sqrt{89}$ D) $\sqrt{113}$

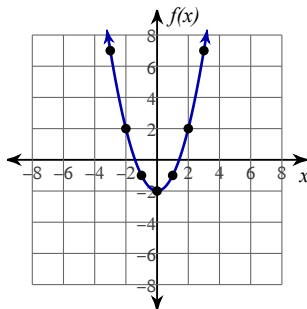
Graph the function.

18) $f(x) = -x^2 - 4x - 3$

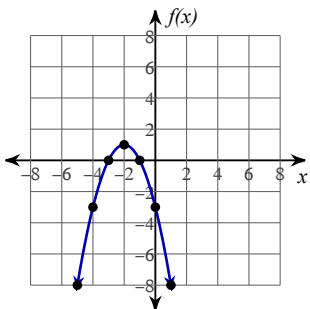
A)



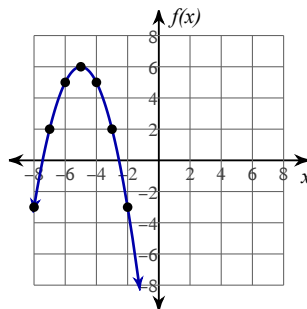
B)



C)

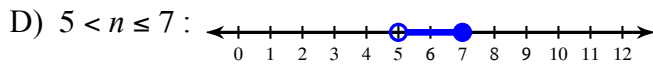
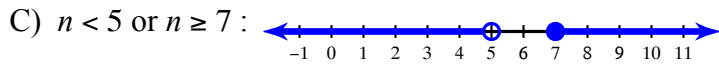
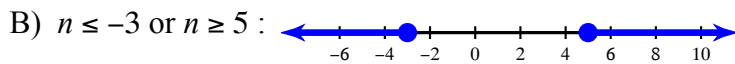
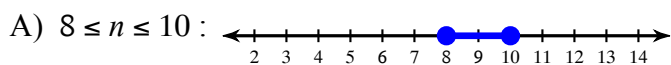


D)



Solve the inequality and graph its solution.

19) $|-9 + n| \leq 1$



Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, and the explicit formula.

20) $-1, 2, -4, 8, \dots$

A) Common Ratio: $r = -2$

$$a_8 = -192$$

$$\text{Explicit: } a_n = \frac{3}{2} \cdot (-2)^{n-1}$$

B) Common Ratio: $r = -2$

$$a_8 = -64$$

$$\text{Explicit: } a_n = \frac{1}{2} \cdot (-2)^{n-1}$$

C) Common Ratio: $r = -2$

$$a_8 = 128$$

$$\text{Explicit: } a_n = -(-2)^{n-1}$$

D) Common Ratio: $r = -4$

$$a_8 = -24576$$

$$\text{Explicit: } a_n = \frac{3}{2} \cdot (-4)^{n-1}$$

21) Aliyah and Abhasra are selling cookie dough for a school fundraiser. Customers can buy packages of sugar cookie dough and packages of double chocolate cookie dough. Aliyah sold 3 packages of sugar cookie dough and 9 packages of double chocolate cookie dough for a total of \$141. Abhasra sold 8 packages of sugar cookie dough and 12 packages of double chocolate cookie dough for a total of \$208. What is the cost each of one package of sugar cookie dough and one package of double chocolate cookie dough?

A) package of sugar cookie dough: \$6, package of double chocolate cookie dough: \$21

B) package of sugar cookie dough: \$7, package of double chocolate cookie dough: \$13

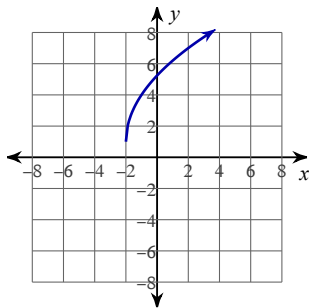
C) package of sugar cookie dough: \$3, package of double chocolate cookie dough: \$20

D) package of sugar cookie dough: \$5, package of double chocolate cookie dough: \$14

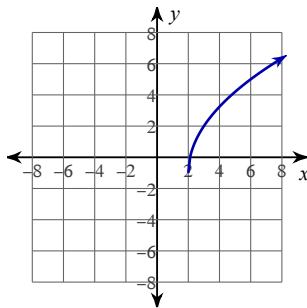
Sketch the graph of the function.

$$22) y = 1 + 3\sqrt{x-2}$$

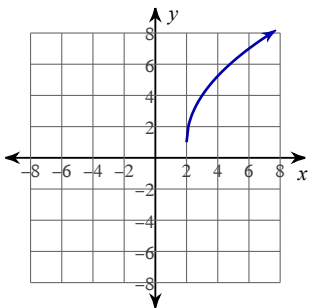
A)



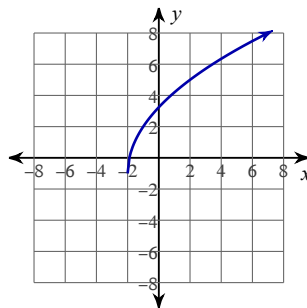
B)



C)



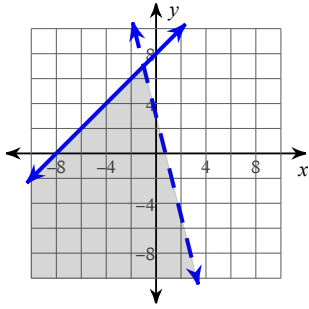
D)



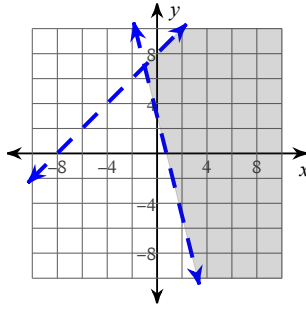
Sketch the solution to the system of inequalities.

23) $x - y \geq -8$
 $4x + y < 3$

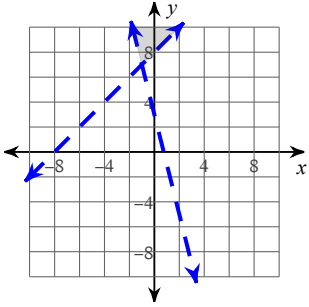
A)



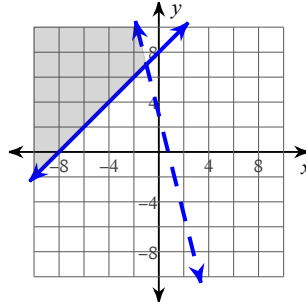
B)



C)



D)



State the possible rational zeros for the function. Then find all zeros.

24) $f(x) = x^5 + 3x^4 + 4x^3 + 12x^2 + 3x + 9$

A) Possible rational zeros: $\pm 1, \pm 3, \pm 9$
 Zeros: $\{-3, i\sqrt{3}, -i\sqrt{3}, i, -i\}$

B) Possible rational zeros: $\pm 1, \pm 3, \pm 9$
 Zeros: $\{-1, \frac{i\sqrt{6}}{2}, -\frac{i\sqrt{6}}{2}, i, -i\}$

C) Possible rational zeros: $\pm 1, \pm 3, \pm 9$
 Zeros: $\{-3, i\sqrt{2}, -i\sqrt{2}, i, -i\}$

D) Possible rational zeros: $\pm 1, \pm \frac{1}{3}, \pm \frac{1}{9}$
 Zeros: $\{-3, i\sqrt{3}, -i\sqrt{3}, i, -i\}$

25) Willie left the hardware store and drove east at an average speed of 75 mph. Jasmine left two hours later and drove in the opposite direction with an average speed of 30 mph. Find the number of hours Jasmine needs to drive before they are 360 mi. apart.

- A) 3 hours B) 4 hours C) 5 hours D) 2 hours

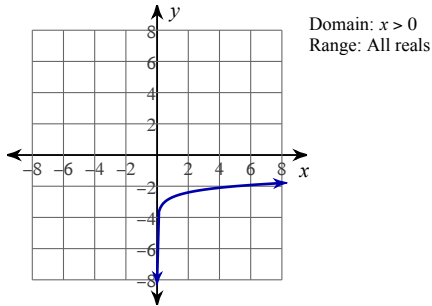
26) 12 fl. oz. of a 85% saline solution was mixed with 8 fl. oz. of a 45% saline solution. What is the concentration of the mixture?

- A) 37% B) 69% C) 82% D) 35%

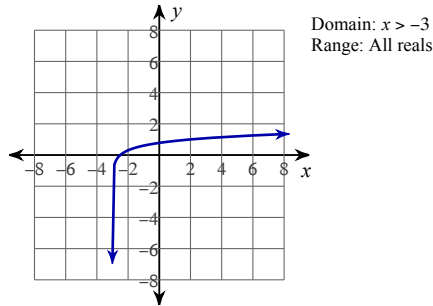
Identify the domain and range of the function. Then sketch the graph.

27) $y = \log(2x + 6)$

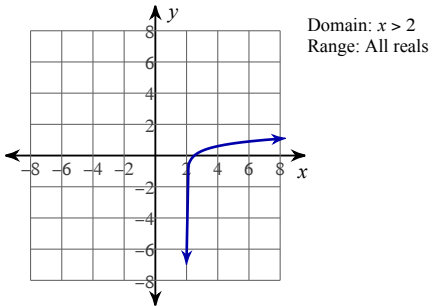
A)



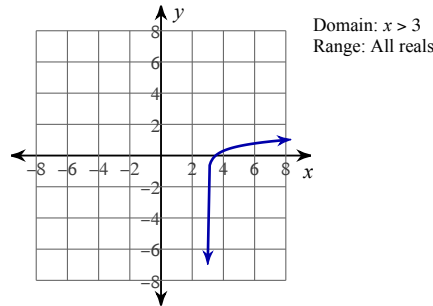
B)



C)



D)



Solve the equation.

28) $(a + 14)^{\frac{2}{3}} = 16$

- A) $\{9, -78\}$ B) $\{78, -78\}$ C) $\{-78\}$ D) $\{50, -78\}$

Solve the question. Round your answer to the nearest hundredth.

29) Working together, John and Nicole can pick forty bushels of apples in 4.95 hours. Had she done it alone it would have taken Nicole 8 hours. How long would it take John to do it alone?

- A) 13.42 hours B) 12.98 hours C) 11.14 hours D) 9.74 hours

30) Lisa left the science museum at the same time as Ashley. They drove in opposite directions. Ashley drove at a speed of 65 mph. After five hours they were 620 mi. apart. How fast did Lisa drive?

- A) 65 mph B) 29 mph C) 59 mph D) 40 mph