

Name _____

Period _____

Date _____

READY

Topic: Solving equations

Solve for x.

1. $5x + 13 = 48$
 $5x = 35$
 $x = 7$

2. $\frac{1}{3}x - 8 = 0$
 $\frac{1}{3}x = 8$
 $x = 24$

3. $-4 - 9x = 0$
 $-9x = 4$
 $x = -\frac{4}{9}$

4. $x^2 - 16 = 0$
 $(x+4)(x-4) = 0$
 $x = -4, x = 4$

5. $x^2 + 4x + 3 = 0$
 $(x+3)(x+1) = 0$
 $x = -3, x = -1$

6. $x^2 - 5x + 6 = 0$
 $(x-2)(x-3) = 0$
 $x = 2, x = 3$

7. $(x+8)(x+11) = 0$
 $x = -8, x = -11$

8. $(x-5)(x-7) = 0$
 $x = 5, x = 7$

9. $(3x-18)(5x-10) = 0$
 $x = 6, x = 2$

SET

Topic: Dividing polynomials

Divide each of the following polynomials. Write only one multiplication statement if the divisor is a factor. Write the two multiplication statements that go with your answers if there is a remainder.

10. $(x+1) \overline{) x^3 - 3x^2 + 6x + 11}$
 $\begin{array}{r} x^2 - 2x + 10 \\ + (-x^3 + x^2) \\ \hline -4x^2 + 6x + 11 \\ + (4x^2 + 4x) \\ \hline 10x + 11 \\ + (-10x + 10) \\ \hline 0 \end{array}$

11. $(x-5) \overline{) x^3 - 9x^2 + 23x - 15}$
 $\begin{array}{r} x^2 - 4x + 3 \\ + (-x^3 + 5x^2) \\ \hline -4x^2 + 23x - 15 \\ + (4x^2 - 20x + 15) \\ \hline 3x - 15 \\ + (-3x + 15) \\ \hline 0 \end{array}$

Multiplication statement(s)

$(x+1)(x^2 - 2x + 10) + 1 = x^3 - 3x^2 + 6x + 11$
 $(x+1)(x^2 - 4x + 10 + \frac{1}{x+1}) = x^3 - 3x^2 + 6x + 11$

Multiplication statement(s)

$(x-5)(x^2 - 4x + 3) = x^3 - 9x^2 + 23x - 15$

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$$\begin{array}{r}
 x^2 + 8x - 13 \\
 (2x-1) \overline{) 2x^3 + 15x^2 - 34x + 13} \\
 \underline{-(2x^3 + x^2)} \\
 11x^2 - 34x + 13 \\
 \underline{-(11x^2 + 8x)} \\
 -26x + 13 \\
 \underline{+(13x + 13)} \\
 0
 \end{array}$$

Multiplication statement(s)
 $(2x-1)(x^2+8x-13) = 2x^3+15x^2-34x+13$

$$\begin{array}{r}
 x^2 + 9x - 10 \\
 (x+4) \overline{) x^3 + 13x^2 + 26x - 25} \\
 \underline{-(x^3 + 4x^2)} \\
 9x^2 + 26x - 25 \\
 \underline{-(9x^2 + 36x)} \\
 -10x - 25 \\
 \underline{+(10x + 40)} \\
 15
 \end{array}$$

Multiplication statement(s)
 $(x+4)(x^2+9x-10) + 15 = x^3+13x^2+26x-25$
 $(x+4)(x^2+9x-10 + \frac{15}{x+4}) = x^3+13x^2+26x-25$

$$\begin{array}{r}
 x^2 - 15x - 6 \\
 (x+7) \overline{) x^3 - 8x^2 - 11x + 10} \\
 \underline{-(x^3 + 7x^2)} \\
 -15x^2 - 11x + 10 \\
 \underline{+(15x^2 + 105x)} \\
 -6x + 10 \\
 \underline{+(6x + 42)} \\
 52
 \end{array}$$

Multiplication statement(s)
 $(x+7)(x^2-15x-6) + 52 = x^3-8x^2-11x+10$
 $(x+7)(x^2-15x-6 + \frac{52}{x+7}) = x^3-8x^2-11x+10$

$$\begin{array}{r}
 x^2 + 9x + 14 \\
 (3x-4) \overline{) 3x^3 + 23x^2 + 6x - 28} \\
 \underline{-(3x^3 + 4x^2)} \\
 2x^2 + 6x - 28 \\
 \underline{-(2x^2 + 36x)} \\
 -30x - 28 \\
 \underline{+(30x + 56)} \\
 28
 \end{array}$$

Multiplication statement(s)
 $(3x-4)(x^2+9x+14) + 28 = 3x^3+23x^2+6x-28$
 $(3x-4)(x^2+9x+14 + \frac{28}{3x-4}) = 3x^3+23x^2+6x-28$

GO
Topic: Describing the features of different functions

Graph the following functions. Then identify the key features of the functions. Include domain, range, intervals where the function is increasing/decreasing, intercepts, maximum/minimum, and end behavior.

16. $f(x) = x^2 - 9$

domain: $(-\infty, \infty)$

range: $[-9, \infty)$

increasing: $(0, \infty)$

decreasing: $(-\infty, 0)$

y-intercept: $(0, -9)$

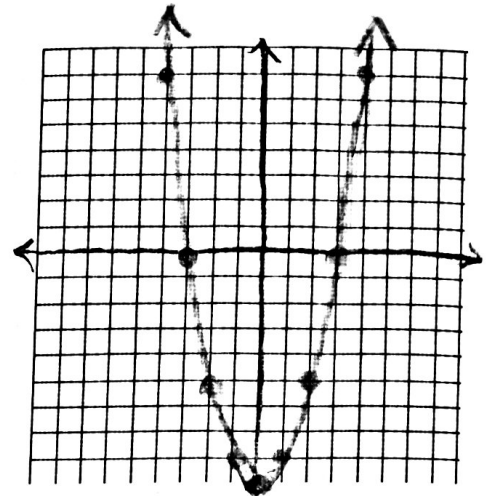
x-intercept(s): $(-3, 0)$
 $(3, 0)$

end behavior:

As $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

As $x \rightarrow \infty$, $f(x) \rightarrow \infty$

$f(1) = 4 = f(2) + 3$



7

17. $f(n-1) = f(n) + 3$; $f(1) = 4$

domain:

range:

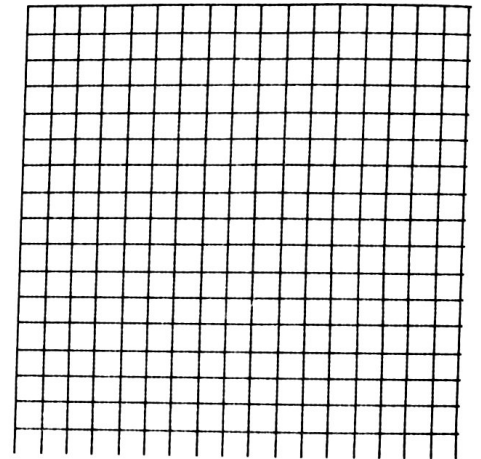
increasing:

decreasing:

y-intercept:

x-intercept(s):

end behavior:



18. $f(x) = \sqrt{x-3} + 1$

domain: $[3, \infty)$

range: $[1, \infty)$

increasing: $[3, \infty)$

decreasing: None

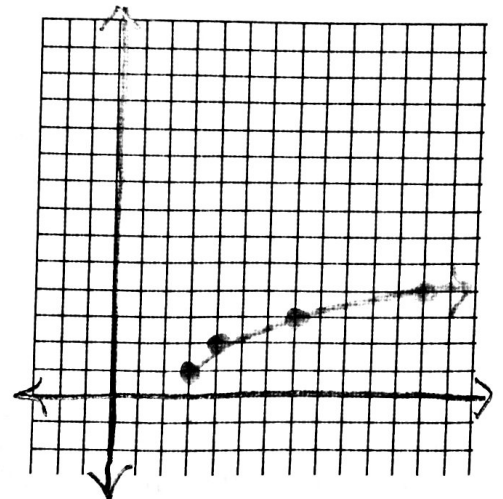
y-intercept: None

x-intercept(s): None

* end behavior:

As $x \rightarrow -\infty$, $f(x) \rightarrow$ undefined

As $x \rightarrow \infty$, $f(x) \rightarrow \infty$



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19. $f(x) = \log_2 x - 1$

domain: $(0, \infty)$

range: $(-\infty, \infty)$

increasing: $(0, \infty)$

decreasing: None

y-intercept: None

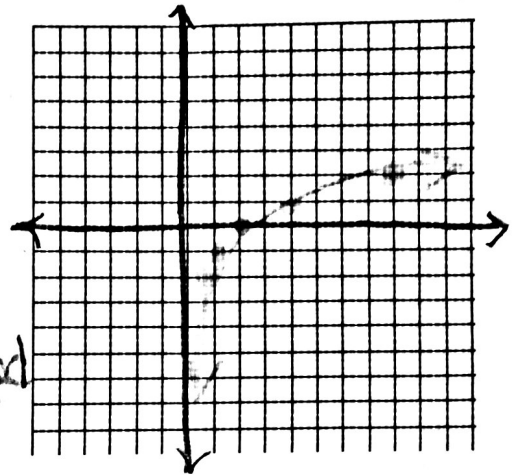
x-intercept(s): $(2, 0)$

end behavior:

As $x \rightarrow -\infty$, $f(x) \rightarrow$

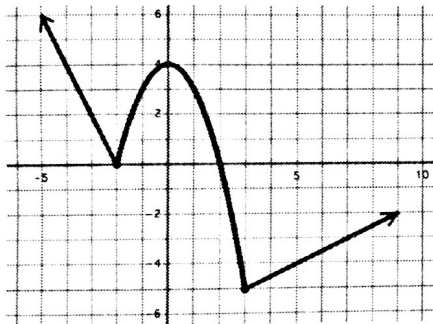
As $x \rightarrow \infty$, $f(x) \rightarrow \infty$

• logs are undefined for neg. values



Identify the key features of the graphed functions.

20.



domain: $(-\infty, \infty)$

range: $[-5, \infty)$

increasing: $(-2, 0) \cup (3, \infty)$

decreasing: $(-\infty, -2) \cup (0, 3)$

y-intercept: $(0, 3)$

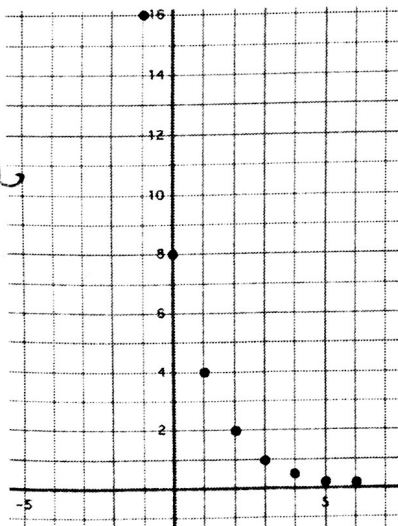
x-intercept(s): $(-2, 0)$ & $(2, 0)$

end behavior: As $x \rightarrow -\infty$, $f(x) \rightarrow \infty$

As $x \rightarrow \infty$, $f(x) \rightarrow \infty$

21.

Discrete



domain: $\{x | x \in \mathbb{Z}, -1 \leq x \leq 6\}$
or $\{-1, 0, 1, 2, 3, 4, 5, 6\}$

range: $\{16, 8, 4, 2, 1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}\}$

increasing: None

decreasing: $\{x | x \in \mathbb{Z}, -1 \leq x \leq 6\}$

y-intercept: $(0, 8)$

x-intercept(s): None

end behavior: Discrete & limited to only the given ordered pairs

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