

5.3 Pre-Quiz: Cumulative year-to-date standards

1. Simplify to standard form. *A.APR.1 Perform operations with polynomials*

$$(x^3 - 3x^2 - 3x - 9) - (2x^3 - x^2 - 5)$$

2. Select each correct equation.

(a) $x^2 - 49 = (x - 7)(x + 7)$

(d) $x^2 + 49 = (x + 7)(x - 7)$

(b) $x^2 + 14x - 49 = (x - 7)^2$

(e) $x^3 - y^3 = (x + y)(x^2 - xy + y^2)$

(c) $x^2 + 14x + 49 = (x + 7)^2$

(f) $x^3 + y^3 = (x - y)(x^2 + xy + y^2)$

3. Write down the solutions to $5x(x - 9)(3x + 5) = 0$. *A.APR.3 Find zeros of polynomials*

4. Solve: $x + 5 = \frac{9x + 37}{x + 5}$

A.REI.2 Solve rational and radical equations

5. Solve for x and check.

(a) $\sqrt{x + 1} + 18 = 16$

(b) Check your solution.

6. Write a recursive definition of the sequence

F.BF.2 Sequences

$$a_1 = -1, a_2 = -\frac{3}{2}, a_3 = -2, a_4 = -\frac{5}{2}, \dots$$

7. Simplify to the form $a + bi$ with a, b real numbers.

N.CN.2 Complex numbers

(a) $(5 - i) - (2 + 3i)$

(b) $(2x - i)(2 + 3i) =$

8. Simplify each expression, using imaginary numbers as necessary.

(a) $\sqrt{-64} =$

(b) $\frac{1}{3}\sqrt{-18} =$

9. Rewrite each expression as a radical.

N.RN.2 Radicals and rational exponents

(a) $5^{\frac{1}{3}} =$

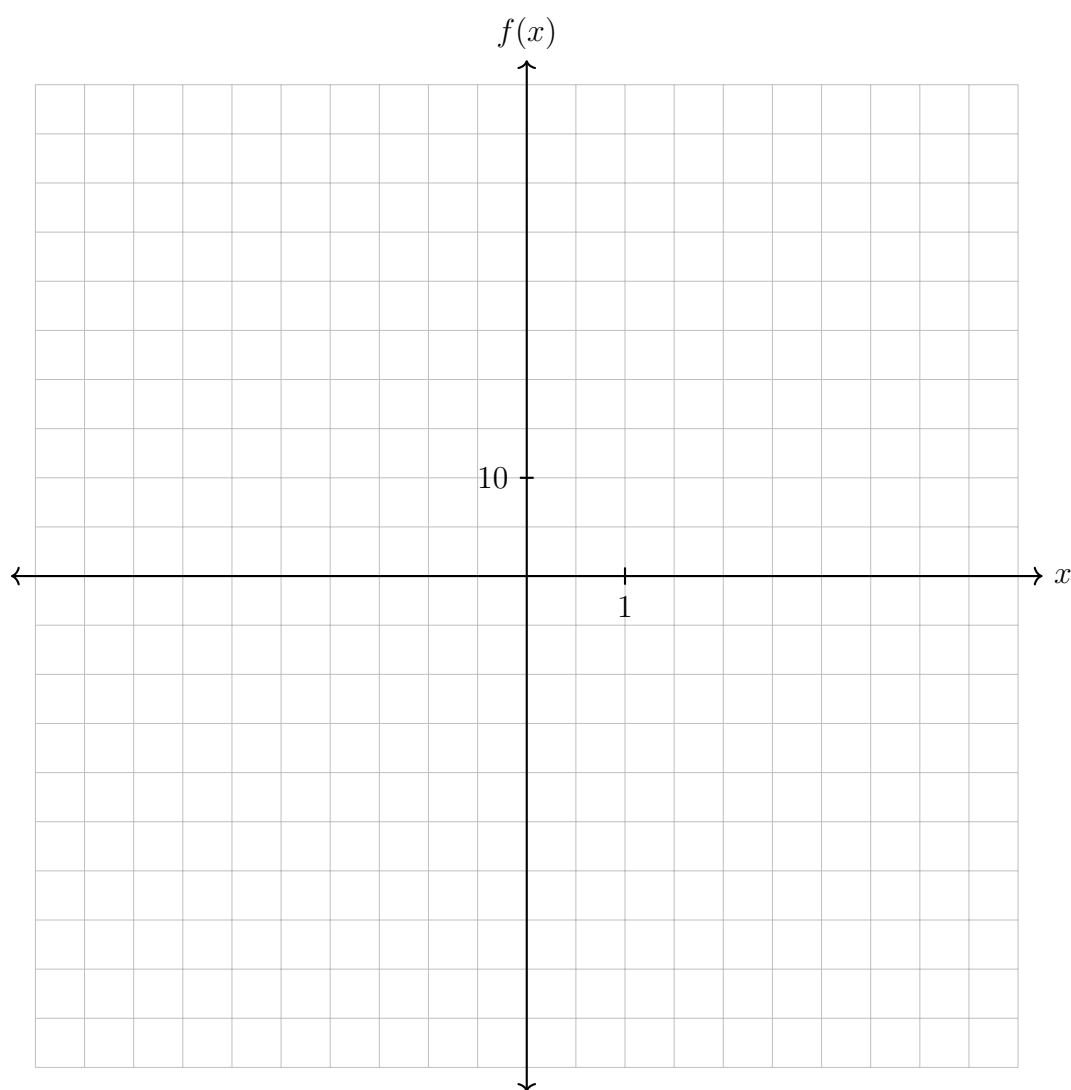
(b) $(8y)^{-\frac{2}{3}} =$

10. Rewrite each expression as a fractional exponent. $x > 0$

(a) $\sqrt{11} =$

(b) $\sqrt[5]{x^3} =$

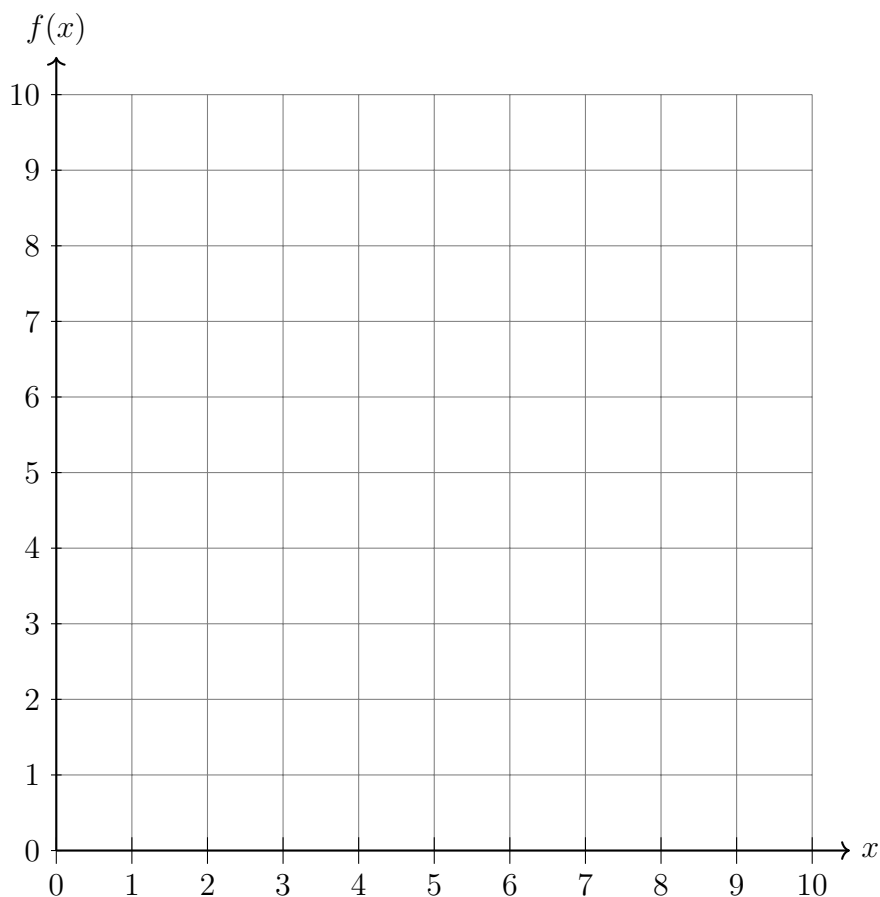
11. Biologists are studying a new bacterium. They create a culture with 100 of the bacteria and anticipate that the number of bacteria will double every 30 hours. Write an equation for the number of bacteria, B , in terms of the number of hours, t , since the experiment began.
12. Graph the function $f(x) = x^4 - 2x^3 - 5x^2 + 3x + 4$.



Mark and label the zeros of the function to the *nearest hundredth*.

Describe the behavior of the given function as x approaches positive infinity.

13. Graph the continuous exponential function $f(x) = 2e^{0.12x}$ on the grid below.



- (a) Graph the line $y = 4$. Mark the intersection of the line with f and label it as an ordered pair, rounded *the nearest whole number*.
- (b) The function $f(x)$ models the growth of an investment. Explain what the values of 2 and 0.12 represent in the context of the investment.
- (c) How long will the investment take to double?