Unit 2 CCA2 Review

1. Solve by completing the square:

a) $x^2 - 6x - 17 = 0$

b) $x^2 - 3x + 1 = 0$

c) $2x^2 - 40x + 5 = 0$

2. Solve by using the quadratic formula:

a) $4x^2 - 36x + 81 = 0$

b) $x^2 + 10x - 7 = 0$

3. Factor the following:

a) $6x^3 + 8x^2 + 15x + 20$

b) $2x^2 - x - 15$

c) $x^3 - 125$

d) $x^3y^6 - 64z^3$

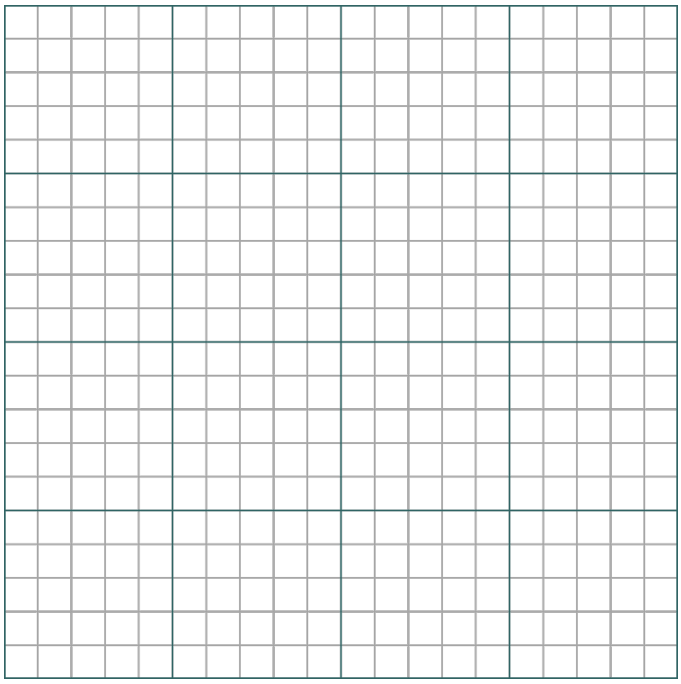
e) $x^3 + 27y^3$

f) $x^4 - 36$

g) $25x^2 - 25x - 14$

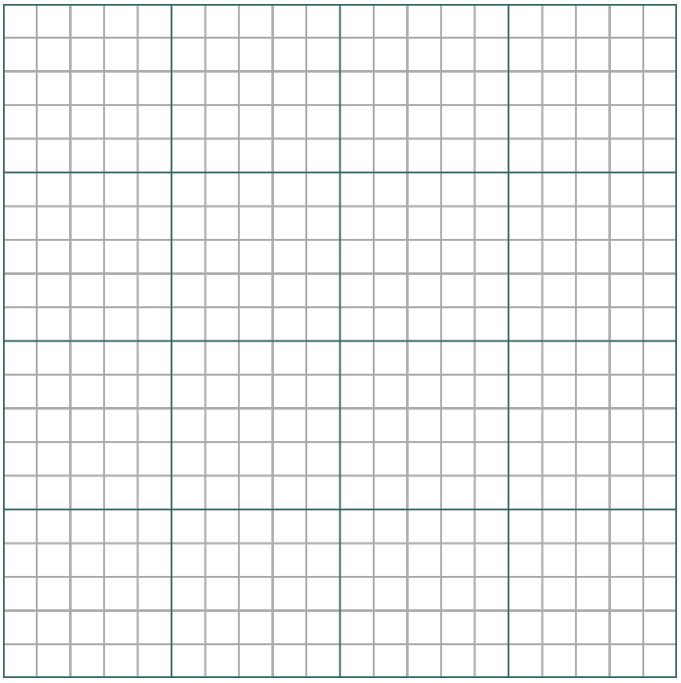
4. Given the function $f(x) = (x - 1)(x - 2)(x + 3)(x + 4)(x + 4)$

a) Find the zeros of the function
b) Find the degree of the function
c) Sketch a graph of the function below



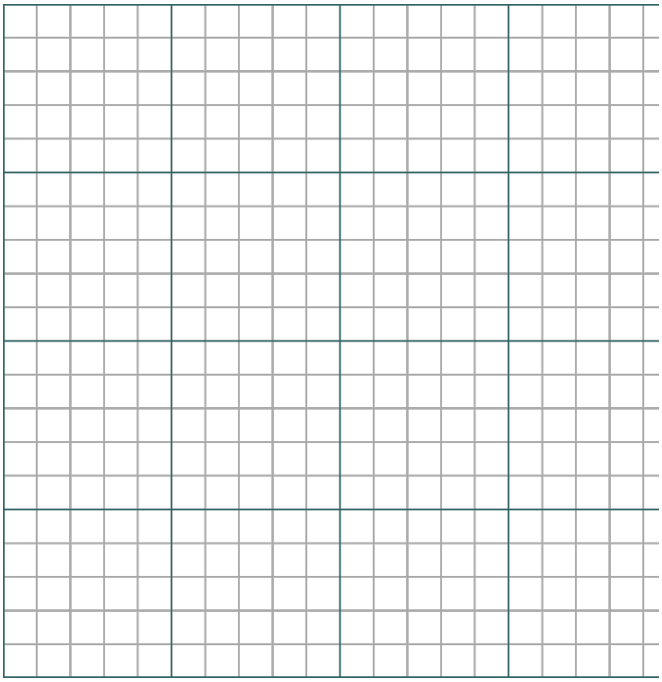
5. Given the function $f(x) = (x - 2)^2$

a) Find the zeros of the function
b) Find the degree of the function
c) Sketch a graph of the function below

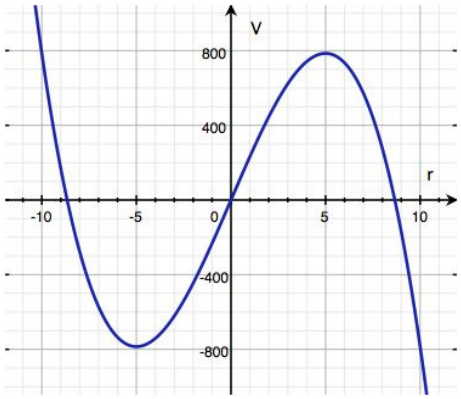


6. Given the function $f(x) = (x - 1)(x + 1)(x - 2)(x + 2)(x + 3)(x - 3)(x - 4)$

a) Find the zeros of the function
b) Find the degree of the function
c) Sketch a graph of the function below



7. Jeannie wishes to construct a cylinder closed at both ends. The figure at right shows the graph of a cubic polynomial function used to model the volume of the cylinder as a function of the radius if the cylinder is constructed using 150 cm^3 of material. Use the graph to answer the questions below. Estimate values to the nearest half unit on the horizontal axis and to the nearest 50 units on the vertical axis.



a) What are the zeros of the function?

b) What are the relative maxima and the relative minima values of the function?

c) The equation of this function is $V(r)=c(r^3-72.25r)$ for some real number c. Find the value of c so that this formula fits the graph.

d) Use the graph to estimate the volume of the cylinder with $r=2$ cm.

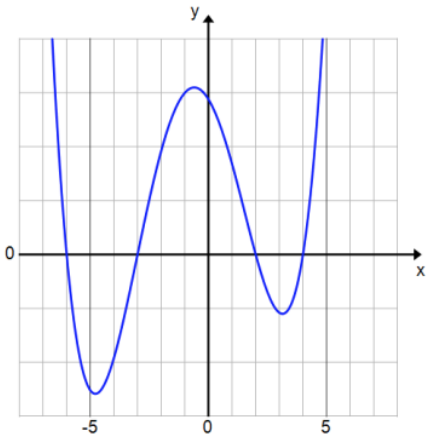
e) Use your formula to find the volume of the cylinder when $r=2$ cm. How close is the value from the formula to the value on the graph?

8. Consider the polynomial $P(x)=x^4+3x^3-28x^2-36x+144$.

a. Is **1** a zero of the polynomial P?

b. Is $x+3$ one of the factors of P?

c. The graph of P is shown to the right. What are the zeros of P?



d. Write the equation of P in factored form.

9. **A building, in the shape of a rectangular prism with a square base, has on its top a radio tower. The building is 25 times as tall as the tower, and the side-length of the base of the building is 100 ft. less than the height of the building. If the building has a volume of 2-million cubic feet, how tall is the tower?**

10. Determine if each binomial is a factor of the polynomial.

a) $\left(2x^3 - 3x^2 - 10x + 3\right) \div (x - 3)$

b) $\left(10x^3 - 11x^2 - 47x + 30\right) \div (x + 2)$

c) $\left(2x^4 + 14x^3 - 2x^2 - 14x\right) \div (x + 7)$

d) $\left(n^4 - n^3 - 10n^2 + 4n + 24\right) \div (n + 2)$