Station 1

Simplify each exponential expression.

24) i^{19}

A) -i B) -1 C) i D) 1

25) i^{21}

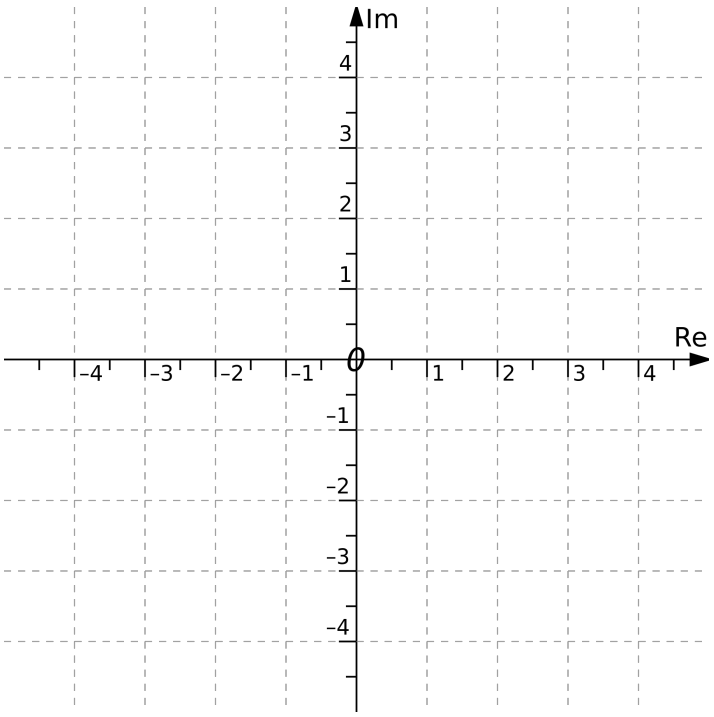
A) i B) -1 C) 1 D) -i

26) i^{14}

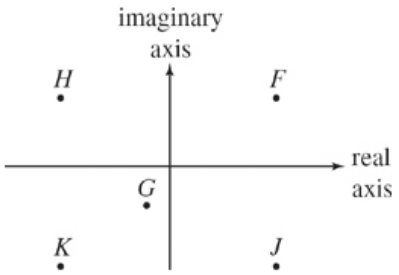
A) i B) -1 C) 1 D) -i

Graph the following numbers on the axis at the right. Label them after you graph them. You do not need to draw an arrow to the point.

1. $1 + 2i$
2. $-1 + 2i$
3. $2 - i$
4. $-2 - i$
5. 0
6. 4
7. $3i$
8. $-3 + 2i$



48. In a complex plane, the vertical axis is the *imaginary axis* and the horizontal axis is the *real axis*. Within the complex plane, a complex number $a + bi$ is comparable to the point (a, b) in the standard (x, y) coordinate plane. $\sqrt{a^2 + b^2}$ is the modulus of the complex point $a + bi$. Which of the complex numbers *F, G, H, J,* and *K* below has the smallest modulus?



F. *F*
G. *G*
H. *H*
J. *J*
K. *K*

Find the absolute value of each complex number.

1) $|7 - i|$

2) $|-5 - 5i|$

3) $|-2 + 4i|$

4) $|3 - 6i|$

5) $|10 - 2i|$

6) $|-4 - 8i|$

Station 2

Find the product.	Factor
1. $(z-4)(z+4)$	5. z^2-144
2. $(z+3i)(z-3i)$	6. y^2+16
3. $(z+\sqrt{13})(z-\sqrt{13})$	7. z^2+15
4. $(z+\sqrt{5}i)(z-\sqrt{5}i)$	8. t^2-9i
	9. z^2+25i

Examples

11. Solve each equation, and state the solutions.

a. $x^2+64=0$

b. $x^2+10x+25=0$

12. Write the left side of each equation as a product of linear factors, and state the solutions.

a. $x^3 - 125 = 0$

b. $x^3 + 8 = 0$

c. $x^4 + 6x^2 + 8 = 0$

d. $x^4 + 9x^2 + 8 = 0$

Station 3

13. Explain how Pascal's triangle allows you to compute the coefficient of x^3y^2 when $(x-y)^5$ is expanded. What is that coefficient?

14. Explain how Pascal's triangle allows you to compute the coefficient of x^5y when $(x+y)^6$ is expanded. What is that coefficient?

Simplify each expression to the form a+bi.

15. $(1-3i)+(2+i)(1+i)$

16. $(1+i)^3-(1-i)^3$

17. $(2+i)^4-(2-i)^4$

18. Consider the expansion of $(a+b)^7$. Determine the coefficients for the terms with the powers of a and b shown.

a. a^2b^5

b. a^6b

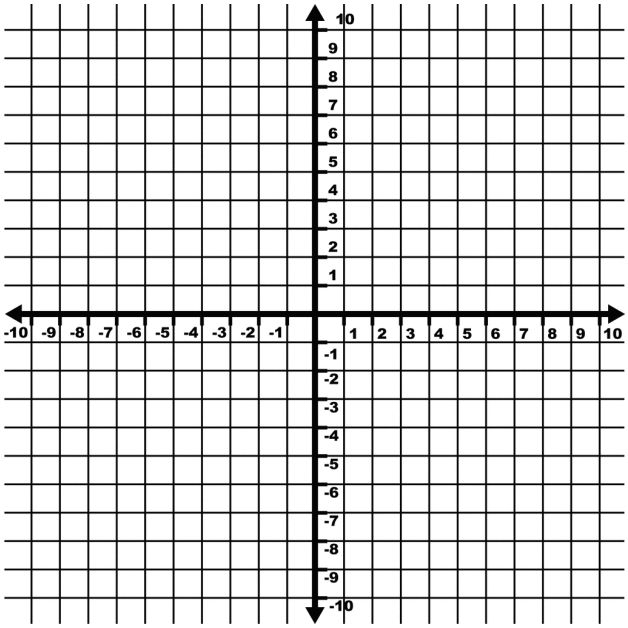
c. b^7

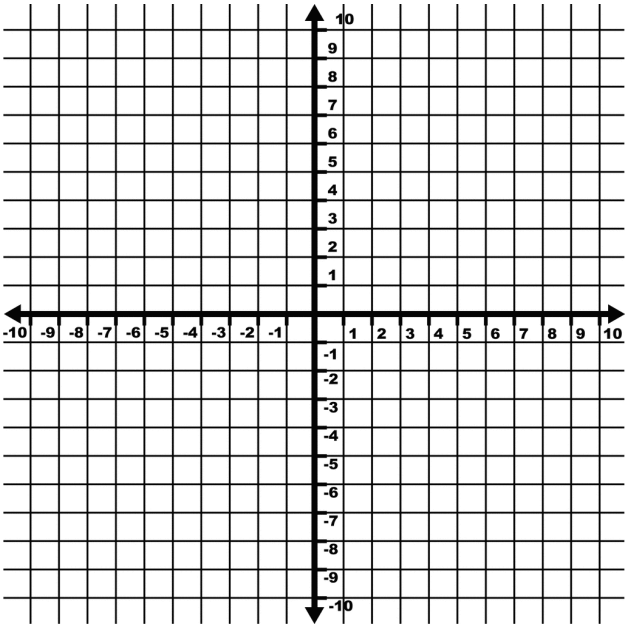
Station 4

Sketch the graphs of each equation.

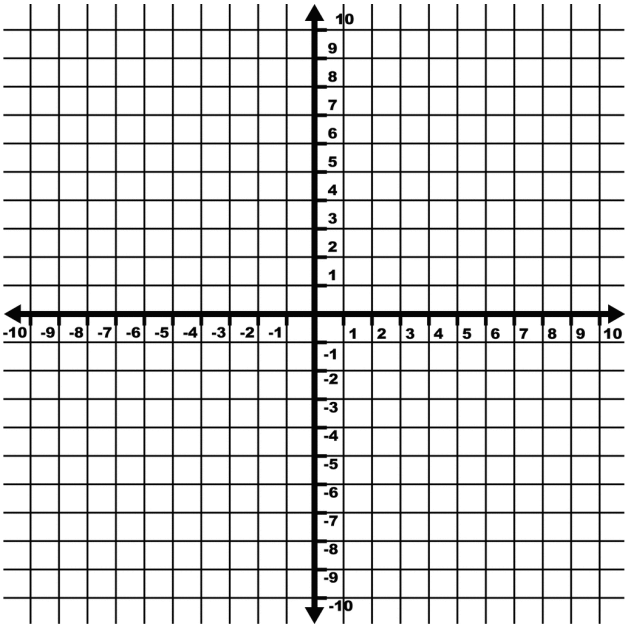
$$\frac{(x-3)^2}{4}+\frac{y^2}{16}=1$$

$$\frac{(x-4)^2}{9}+(y-1)^2=1$$





$$\frac{(x-3)^2}{9}+\frac{(y+1)^2}{16}=1$$



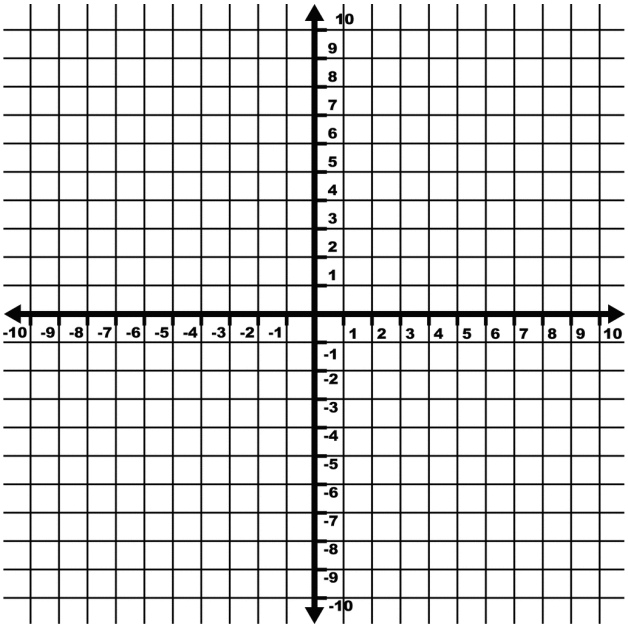
$$\frac{(x+2)^2}{49}+\frac{(y-1)^2}{9}=1$$

a. What is the center?

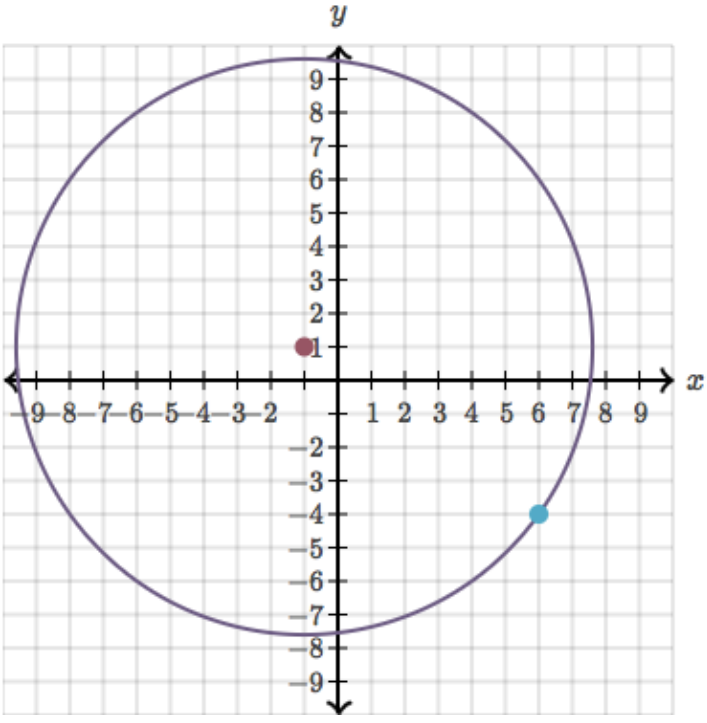
b. What is the semi-major axis?

c. What is the semi-minor axis?

d. Graph the ellipse.



Write the equation of the circle graphed below.



Station 5

1. Given the function $f(x) = (x+1)^2(x-1)(x+4)^3$ determine the intervals on which the function is positive and negative.

2. Consider the cubic polynomial p given $p(t) = t^3 - 125$.

a. Find a real number zero/root to the polynomial by factoring.

b. Write $p(t)$ as a product of three linear terms. Then state ALL of the zeros.

3. Find all of the factors (real and complex) to the polynomial $r(x) = x^4 - 81$

4. In the expansion of the polynomial $(x + 3y)^3$, what is the coefficient in front of the term xy^2?

5. In the expansion of the polynomial $(2x + 4y)^4$, what is the coefficient in front of the term x^2y^2?