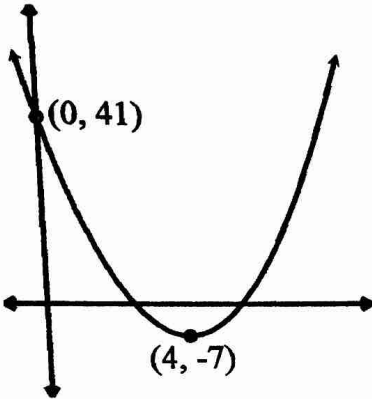


Graph to Equation

1. Find the equation in vertex form.



$$y = a(x-h)^2 + k$$

$$y = a(x-4)^2 - 7$$

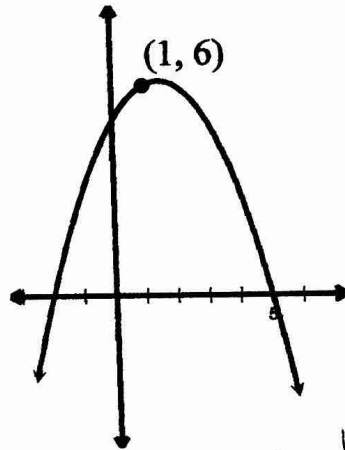
$$41 = a(0-4)^2 - 7$$

$$48 = 16a$$

$$3 = a$$

$$y = 3(x-4)^2 - 7$$

2. Find the equation in factored form and standard form.



$$y = a(x-p)(x-q)$$

$$y = a(x+2)(x-5)$$

$$6 = a(1+2)(1-5)$$

$$6 = a(3)(-4)$$

$$-1/2 = a$$

$$y = -1/2(x^2 - 3x - 10)$$

$$y = -1/2x^2 + 3/2x + 5$$

$$y = -1/2(x+2)(x-5)$$

3. What if the definition of a polynomial & example?

$ax^n + bx^{n-1} \dots$ monomials put together.

4. What is a quadratic & give an example?

$x^2 - 10$, highest degree is 2

5. Rewrite $f(x) = x^2 + 6x - 17$ in vertex form by completing the square.

$$f(x) = (x^2 + 6x + 9) - 17 - 9$$

$$f(x) = (x+3)^2 - 26$$

6. Rewrite $h(x) = 2x^2 + 24x + 9$ in vertex form by completing the square.

$$h(x) = 2(x^2 + 12x + 36) + 9 - 72$$

$$h(x) = 2(x+6)^2 - 63$$

3. Find the roots of $h(x) = -3x^2 + 6x - 2$.

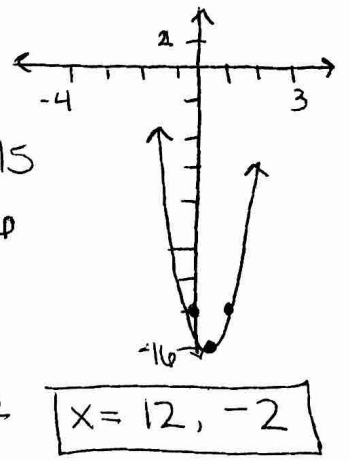
$$a = -3, b = 6, c = -2$$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(-3)(-2)}}{2(-3)} = \frac{-6 \pm \sqrt{36 - 24}}{-6} = \frac{-6 \pm \sqrt{12}}{-6} = \frac{-6 \pm 2\sqrt{3}}{-6}$$

$$= \frac{-3 \pm \sqrt{3}}{-3}$$

4. Sketch a complete graph of $j(x) = 4x^2 + 4x - 15$.

vertex: $\frac{-b}{2a} = \frac{-4}{2(4)} = -\frac{1}{2}$ $j(-\frac{1}{2}) = 4(-\frac{1}{2})^2 + 4(-\frac{1}{2}) - 15 = 1 - 2 - 15 = -16$



1. Solve. $0 = x^2 - 10x - 24$
 $a=1, b=-10, c=-24$

~~$0 = x^2 - 10x - 24$~~
 $x = \frac{10 \pm \sqrt{100 - 4(1)(-24)}}{2} = \frac{10 \pm \sqrt{196}}{2} = \frac{10 \pm 14}{2}$ $x = 12, -2$

2. Find the discriminant of $f(x) = 2x^2 - 7x + 10$. Then, determine the number and type of solutions.

$D = b^2 - 4ac$
 $D = (-7)^2 - 4(2)(10)$
 $D = 49 - 80 = -31$ no real roots

3. Solve. $5x^2 - 4 = 8x^2 + 2x - 6$

$0 = 3x^2 + 2x - 2$
 $x = \frac{-2 \pm \sqrt{4 - 4(3)(-2)}}{2(3)} = \frac{-2 \pm \sqrt{28}}{6} = \frac{-2 \pm 2\sqrt{7}}{6} = \frac{-1 \pm \sqrt{7}}{3}$ $\frac{-1 \pm \sqrt{7}}{3}$

Given $A = 3 + 7i$, $B = 4 - i$, $C = -6 + 2i$ and $D = 2i$, find:

1. $A + 2B$

$3 + 7i + 8 - 2i$
 $11 + 5i$

2. $3B - C$

$12 - 3i - (-6 + 2i)$
 $12 - 3i + 6 - 2i$
 $18 - 5i$

3. $A \cdot D^5$

$(3 + 7i)(2i)^5$
 $(3 + 7i)(32i^5)$
 $(3 + 7i)(32i) = \frac{96i + 224i^2}{96i - 224}$

4. $A \cdot C$

$(3 + 7i)(-6 + 2i)$
 $-18 - 42i + 6i + 14i^2$
 $-18 - 36i - 14$
 $-32 - 36i$

3. Simplify $\frac{3}{4 - \sqrt{5}} \left(\frac{4 + \sqrt{5}}{4 + \sqrt{5}} \right)$

$\frac{12 + 3\sqrt{5}}{16 - 5} = \frac{12 + 3\sqrt{5}}{11}$ $\frac{12 + 3\sqrt{5}}{11}$

4. Simplify $\frac{6 + 2i}{1 - 3i} \left(\frac{1 + 3i}{1 + 3i} \right) = \frac{6 + 2i + 18i + 6i^2}{1 - 9i^2} = \frac{6 + 20i - 6}{10} = \frac{20i}{10} = 2i$ $2i$