3-19-14

3rd Trig

X-intercepts ≠ y-intercepts

y-intercept
X value is 0.

● (0,4)

● (0,2)

X

(-4,0)   (2,0) (5,0)

y-value of
zero

● (0,-3)

Y

$$y = x^2 - 6x - 7$$

Find x and y intercepts

X-intercept
y value is 0.

$$0 = x^2 - 6x - 7$$

$$0 = (x-7)(x+1)$$

x = 7   or x = -1

(7,0)   (-1,0)
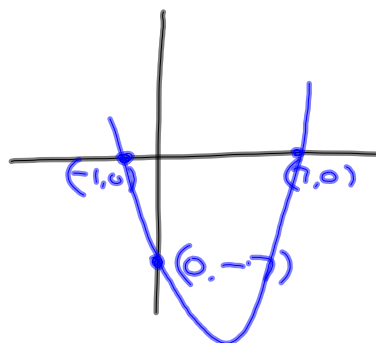
y-intercept
X value is 0.

$$y = 0^2 - 6(0) - 7$$

$$y = -7$$

(0,-7)

(-1,0)   (7,0)

(0,-7)

1

Find x and y-intercept
of

$$f(x) = x^2 + 8x - 9$$

__X-intercept__ Set y = 0

$$0 = x^2 + 8x - 9$$
$$0 = (x+9)(x-1)$$

$$x = -9 \qquad x = 1$$
$$(-9, 0) \qquad (1, 0)$$

__y-intercept__ Set x = 0

$$y = 0^2 + 8(0) - 9$$
$$y = -9$$
$$(0, -9)$$

② $$f(x) = 4x^2 - 7x - 2$$

__X-intercept__ Set y = 0

$$0 = 4x^2 - 7x - 2$$
$$0 = (4x + 1)(x - 2)$$

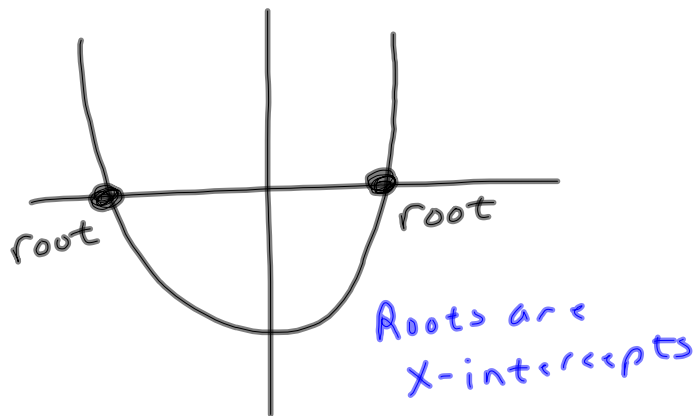$$4x + 1 = 0 \qquad x - 2 = 0$$
$$x = -\frac{1}{4} \qquad x = 2$$
$$\left(-\frac{1}{4}, 0\right) \qquad (2, 0)$$

__y-intercept__ Set x = 0

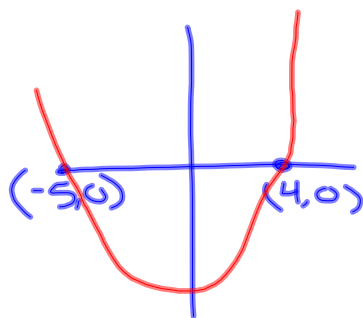$$y = 4(0)^2 - 7(0) - 2$$
$$y = -2$$
$$(0, -2)$$

root   root

Roots are
X-intercepts

⑥ What are the roots of
$$x^2 + x - 20 ?$$
$$x^2 + x - 20 = 0$$
$$(x+5)(x-4) = 0$$
$$x = -5 \qquad x = 4$$

$(-5, 0)$ $(4, 0)$

Give me an equation where
6 is a root to an equation
$$x + 2 = 8 \qquad 2x = 12$$
$$x - 6 = 0$$

Give equation where
2 and 5 are the roots
$$(x-2) \cdot (x-5) = 0$$
$$x^2 - 7x + 10 = 0$$

Give equation that has roots

2i and -2i

$$(x-2i)(x+2i)=0$$

$$x^2 + \cancel{2ix - 2ix} - 4 \boxed{i^2}$$
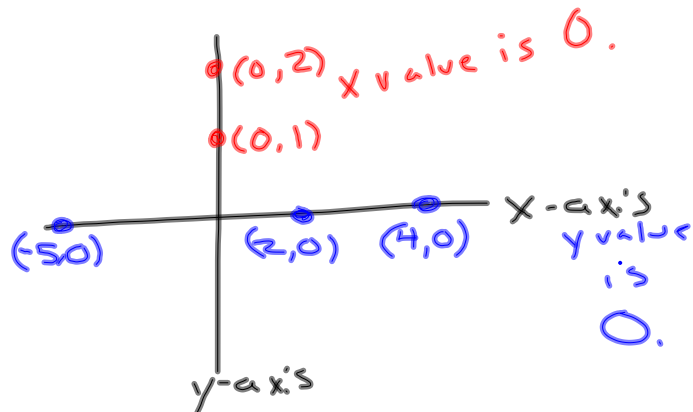
$$i^2 = -1$$

$$x^2 + 4 = 0$$

Roots   3   3i   -3i

$$(x-3)\boxed{(x-3i)(x+3i)} = 0$$

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

$$x^3 - 3x^2 + 9x - 27 = 0$$

4

3-19-14
4th Trig

$(0,2)$ x value is 0.

$(0,1)$

_____ x-axis

$(-5,0)$ $(2,0)$ $(4,0)$ y value
                                    is
                                    $0.$

y-axis

Find x and y intercept
of $y = x^2 + 6x + 5$

X-intercept   Set $y = 0$
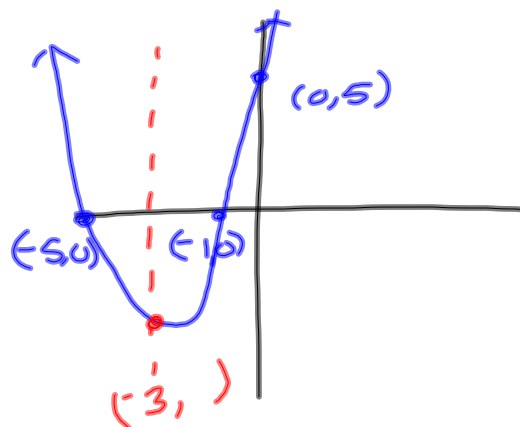
$0 = x^2 + 6x + 5$
$0 = (x+5)(x+1)$
    $x = -5$ $x = -1$
    $(-5, 0)$ $(-1, 0)$

y-intercept   Set $x = 0$

$y = 0^2 + 6(0) + 5$
$y = 5$
$(0, 5)$

$(0,5)$

$(-5,0)$ $(-1,0)$

$(-3, \quad)$

Find x and y intercept
of

$$f(x) = 4x^2 - 7x - 2$$

X-intercept   Set y = 0

$$0 = 4x^2 - 7x - 2$$

$$0 = (4x + 1)(x - 2)$$

$$4x + 1 = 0 \qquad\qquad x - 2 = 0$$
$$x = -\frac{1}{4} \qquad\qquad\qquad x = 2$$

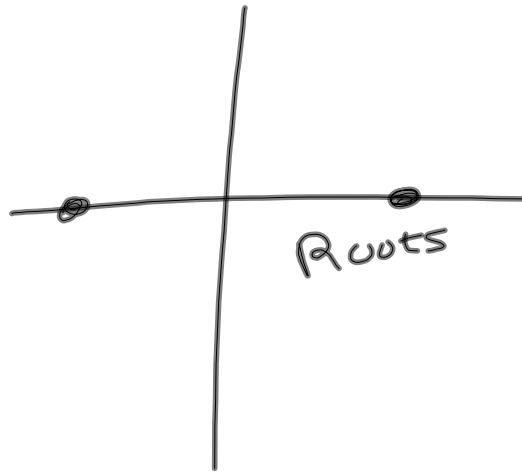$$\left(-\frac{1}{4}, 0\right) \qquad\qquad (2, 0)$$

y-intercept   Set x = 0

$$y = 4(0)^2 - 7(0) - 2$$

$$y = -2$$

$$(0, -2)$$

Roots

What are the roots of
$$x^2 + 10x + 9 \,?$$

$$x^2 + 10x + 9 = 0$$
$$(x+9)(x+1) = 0$$
$$x = -9 \qquad x = -1$$

Give me an equation
where the root is 5.

$$x + 6 = 11 \qquad x - 5 = 0$$

Give me an equation
where the roots are 2 and 8.

$$(x-2)(x-8) = 0$$
$$x^2 - 10x + 16 = 0$$

Give me an equation
w/ roots of 3i and -3i.

$$(x-3i)(x+3i) = 0$$
$$x^2 + 3ix - 3ix - 9i^2$$
$$x^2 + 9 = 0$$

i² = -1

$$5, \; 2i, \; -2i$$

$$(x-5)\boxed{(x-2i)(x+2i)} = 0$$

$$(x-5)(x^2+4) = 0$$

$$x^3 - 5x^2 + 4x - 20 = 0$$