Given the polynomials below, Identify the y-intercept.

1. $f(x) = 3x^3 + 2x^2 - 6x - 1$ (0, -1)

2. $f(x) = -4x^4 - 5x^3 + 2x^2 + 4x + 5$ (0, 5)

How many solutions does the polynomial below have? Also, identify the degree and name the function.

3. $f(x) = -2x^3 + 6x^2 - 5x + 3$
# of solutions: 3
Degree: 3
Name of function: cubic

4. $f(x) = 2x^4 + x^3 - x^2 + 4x + 3$
# of solutions: 4
Degree: 4
Name of function: Quartic

Write the polynomial function in factored form that has zeros:

5. 1, -2, 5
$(x-1)(x+2)(x-5)$

6. 4, 3i, -3i
$(x-4)(x-3i)(x+3i)$

7. 0, -1, -6, 9

a) x(x - 1)(x - 6)(x + 9)
b) x(x + 1)(x + 6)(x - 9)
c) x(x - 1)(x + 6)(x + 9)
d) x(x + 1)(x - 6)(x - 9)

Find all zeros of the polynomial function. One factor has been given

8. $x^3 - 7x^2 - 9x + 63 = 0$; $x + 3$
a=1 b=-7 c=-9 d=63 polysolve #2

a) x= -3, x = 3, x = 7
b) x = 3, x = -3, x = -7
c) x = 3, x = -3, x = 7
d) x = -3, x = -3, x = -7

9. $2x^3 - 23x^2 + 85x - 100 = 0$; $x - 5$
poly solv #

a) x = 5, x= 4, x = 5/2
b) x = -5, x = -4, x = -5/2
c) x = 5, x = -4, x = 5/2
d) x = -5, x = 4, x = -5/2

10. $3x^3 - 2x^2 - 61x - 20 = 0$; $x + 4$

-4	3	-2	-61	-20
	↓	-12	56	20
	3	-14	-5	0

$3x^2 - 14x - 5 = 0$
$(x - 5)(x + 1/3) = 0$
$(x - 15/3)(x + 1/3) = 0$
$(3x - 15)(3x + 1) = 0$
$x = 5, x = -1/3, x = -4$

11. $x^3 - 10x^2 + 31x - 30 = 0$; $x - 2$

2	1	-10	31	-30
	↓	2	-16	30
	1	-8	15	0

$x^2 - 8x + 15 = 0$
$(x - 5)(x - 3) = 0$
$x = 2, x = 5, x = 3$

Find all zeros of the polynomial function. One zero has been given

12. $2x^3 - 7x^2 + 2x + 3 = 0$; 3

3	2	-7	2	3
	↓	6	-3	-3
	2	-1	-1	0

$2x^2 - 1x - 1 = 0$
$x^2 - 1x - 2 = 0$
$(x - 2)(x + 1) = 0$
$x = 1, x = -1/2, x = 3$

13. $x^3 + 7x^2 + 2x - 40 = 0$; -5

-5	1	7	2	-40
	↓	-5	-10	40
	1	2	-8	0

$x^2 + 2x - 8 = 0$
$(x - 2)(x + 4) = 0$
$x = -5, x = 2, x = -4$

14. $x^3 - 5x^2 - 9x + 45 = 0$; 5
poly solv #

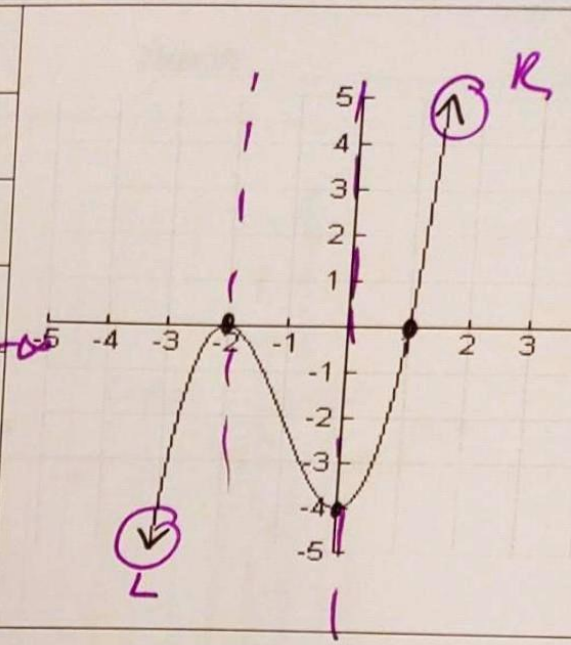
a) x = 5, x = 3, x = -3
b) x = 5, x= 3, x = 3
c) x = -5, x = -3, x = -3
d) x = -5, x = 3, x = -3

15. $x^3 + x^2 - 17x + 15 = 0$; -5

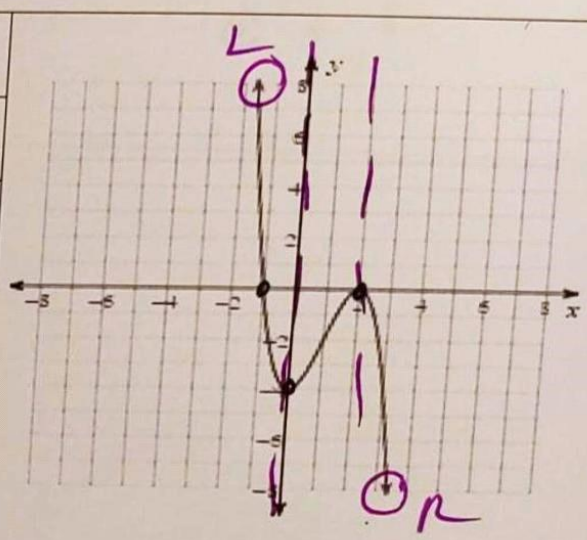
-5	1	1	-17	15
	↓	-5	20	-15
	1	-4	3	0

$x^2 - 4x + 3 = 0$
$(x - 3)(x - 1) = 0$
$x = 3, x = 1, x = -5$

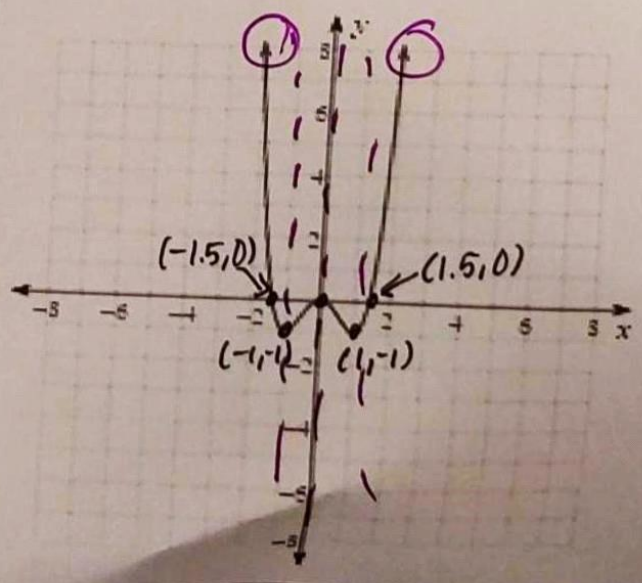
Degree & Name	3 Cubic	Relative Maximum	$(-2, 0)$
Domain	$(-\infty, \infty)$	Relative Minimum	$(0, -4)$
Range	$(-\infty, \infty)$	Intervals of Increase	$(-\infty, -2)$ & $(0, \infty)$
y-intercept	$(0, -4)$	Interval of Decrease	$(-2, 0)$
x-intercept(s)	$(-2, 0)$, $(-2, 0)$, $(1, 0)$	Symmetry (even, odd, Neither)	N
Left end behavior	As $x \to -\infty$, $y \to -\infty$		
Right end behavior	As $x \to \infty$, $y \to \infty$		



Degree & Name	3 Cubic	Relative Maximum	$(2, 0)$
Domain	$(-\infty, \infty)$	Relative Minimum	$(0, -4)$
Range	$(-\infty, \infty)$	Interval of Increase	$(0, 2)$
y-intercept	$(0, -4)$	Intervals of Decrease	$(-\infty, 0)$ & $(4, \infty)$
x-intercept(s)	$(-1, 0)$, $(2, 0)$, $(2, 0)$	Symmetry (even, odd, Neither)	N
Left end behavior	As $x \to -\infty$, $y \to \infty$		
Right end behavior	As $x \to \infty$, $y \to -\infty$		



Degree & Name	4 Quartic	Relative Maximum	$(0, 0)$
Domain	$(-\infty, \infty)$	Absolute & Relative Minimum	$(-1, -1)$ & $(1, -1)$
Range	$[-1, \infty)$	Intervals of Increase	$(-1, 0)$ & $(1, \infty)$
y-intercept	$(0, 0)$		
x-intercept(s)	$(1.5, 0)$, $(0, 0)$, $(0, 0)$, $(1.5, 0)$	Intervals of Decrease	$(-\infty, -1)$ & $(0, 1)$
Left end behavior	As $x \to -\infty$, $y \to \infty$	Symmetry (even, odd, Neither)	E
Right end behavior	As $x \to \infty$, $y \to \infty$		



Degree & Name	4 QUARTIC	**Absolute & Relative Maximum**	(-1, 0) & (1, 0)
Domain	(-∞, ∞)	**Relative Minimum**	(0, 0)
Range	(-∞, 1]	**Intervals of Increase**	(-∞, -1) & (0, 1)
y-intercept	(0, 0)		
x-intercept(s)	(-1.5, 0), (0, 0), (0, 0), (1.5, 0)	**Intervals of Decrease**	(-1, 0) & (1, ∞)
Left end behavior	As x → -∞, y → -∞	**Symmetry (even, odd, Neither)**	E
Right end behavior	As x → ∞, y → -∞