

Name Key

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

1) _____

Find the x-intercept, y-intercept, horizontal, and vertical asymptotes if they exist. Make sure to show work for each to receive full credit. No work no credit!!!!!!! Capiche

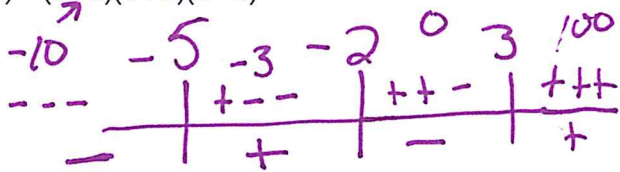
$(-3, 0)$ $(2, 0)$
 X-int $2x^2 + 2x - 12 = 0$
 $2(x^2 + x - 6)$
 $2(x+3)(x-2)$

$2x^2 + 2x - 12$
 $x^2 - 16$
 Y-int $\frac{0+0-12}{0-16} = \frac{-12}{-16} = \frac{3}{4}$
 $(0, \frac{3}{4})$

HA: $y = 2$
 VA: $x = \pm 4$
 $x^2 - 16 = 0$
 $(x-4)(x+4)$

Determine the x values that cause the polynomial function to be (a) zero, (b) positive, and (c) negative.

2) $f(x) = (x+5)(x+2)(x-3)$ _____



- A) $-5, -2, 3$
 B) $(-5, -2) \cup (3, \infty)$
 C) $(-\infty, -5) \cup (-2, 3)$

Divide $f(x)$ by $d(x)$, and write a summary statement in the form indicated.

3) $f(x) = x^4 + 3x^3 + 6x^2 + 3x + 5$, $d(x) = x^2 + 1$ (Write answer in fraction form) _____

$x^2 + 1 \overline{) x^4 + 3x^3 + 6x^2 + 3x + 5}$
 $\underline{-x^4 - 6x^2 - 5}$
 $3x^3 + 5x^2 + 3x$
 $\underline{-3x^3 - 3x }$
 $5x^2 + 3$
 $\underline{-5x^2 }$
 3

Divide using synthetic division, and write a summary statement in fraction form.

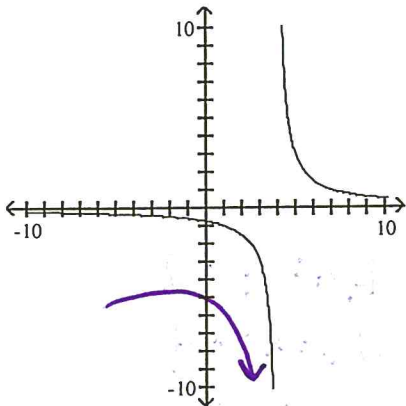
$4) \frac{2x^3 + 3x^2 + 4x - 10}{x + 1}$

$-1 \overline{) 2 \quad 3 \quad 4 \quad -10}$
 $\underline{-2 \quad -2 \quad -3}$
 $2 \quad 1 \quad 3 \quad -13$

$2x^2 + x + 3 - \frac{13}{x+1}$
 4) _____

Evaluate the limit based on the graph of f shown.

5) _____



$-\infty$

$\lim_{x \rightarrow 10^-} f(x)$

Find a polynomial of degree 3 with real coefficients that satisfies the given conditions.

6) Zeros: -2, 1, 0; f(2) = 24

6) _____

$x(x+2)(x-1)$

$3a = 24$
 $a = 3$

$3x(x+2)(x-1)$

$a(2)(2+2)(2-1) = 24$

Find the remainder when f(x) is divided by (x - k)

7) $f(x) = x^5 - 7x^4 + 5x^3 - 5x^2 + 4x - 4$; $k = 7$

7) _____

$(7)^5 - 7(7)^4 + 5(7)^3 - 5(7)^2 + 4(7) - 4 = 1494$

Find the zeros of the polynomial function and state the multiplicity of each.

8) $f(x) = 3(x+9)^2(x-9)^3$

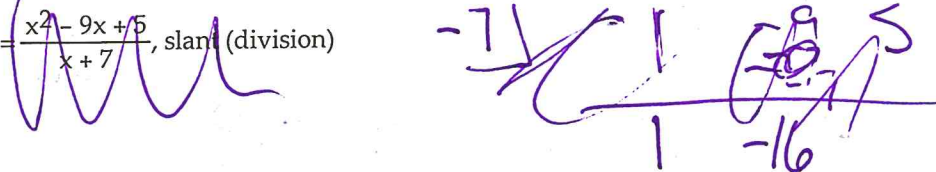
8) _____

-9 , mult 2
 9 , mult 3

For the given function, find all asymptotes of the type indicated (if there are any)

9) $f(x) = \frac{x^2 - 9x + 5}{x + 7}$, slant (division)

9) _____



If the following is a polynomial function, then state its degree and leading coefficient. If it is not, then state this fact.

10) $f(x) = 7x^3 - 8x - 1$

10) _____

yes, deg 3
lead c. = 7

Solve the equation

11) $\frac{2x}{x+2} + \frac{5}{x-5} = \frac{8}{x^2-3x-10}$

$2x^2 - 10x + 5x + 10 = 8$

$2x^2 - 5x + 10 = 8$

$2x^2 - 5x + 2 = 0$

$2x^2 - 4x - 1x + 2 = 0$

$2x(x-2) - 1(x-2)$

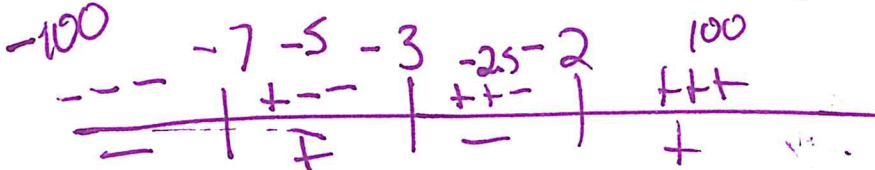
$(2x-1)(x-2)$

11)

$2, \frac{1}{2}$

Solve the polynomial inequality. (analytically, use chart)

12) $(x+7)(x+3)(x+2) < 0$



$(-\infty, -7) \cup (-3, -2)$

Use a cubic or quartic regression (as specified) to fit a curve through the points given in the table. Round to the nearest hundredth.

13)

x	-5	0	2	3
y	-60	5	3	10

 (Cubic)

13)

Write a polynomial function of minimum degree with real coefficients whose zeros include those listed. Write the polynomial in standard form.

14) $3i$ and 5

$(x-3i)(x-5)(x+3i)$

14)

$(x-3i)(x+3i)$

$(x^2+9)(x-5)$

$x^3 - 5x^2 + 9x - 45$

Write the quadratic function in vertex form.

15) $y = x^2 - 2x$

$1^2 - 2(1) = -1 = k$

$-\frac{-2}{2(1)} = 1 = h$

$(x-1)^2 - 1$

15)

1. The first part of the paper is devoted to a general discussion of the problem.

2. In the second part we shall consider the case of a homogeneous medium.

3. The third part is devoted to the study of the asymptotic behavior of the solution.

4. Finally, in the fourth part we shall discuss the numerical solution of the problem.

5. The first part of the paper is devoted to a general discussion of the problem.

6. In the second part we shall consider the case of a homogeneous medium.

7. The third part is devoted to the study of the asymptotic behavior of the solution.

8. Finally, in the fourth part we shall discuss the numerical solution of the problem.