

CHAPTER 3 REVIEW KEY

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1) $f(x) = -3x^2 - 6x - 5$

vertex: $\frac{-(-6)}{2(-3)} = -1$ $f(-1) = -2$

Axis: $x = -1$

Domain: $(-\infty, \infty)$



$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-3)(-5)}}{2(-3)}$$

$$= \frac{6 \pm \sqrt{36 - 60}}{-6}$$

$$= \frac{-3 \pm \sqrt{6}}{3}$$

No x-int
y-int = (0, -5)

2

-2	3	2	-1	5	-6
	+6	8	-14	18	
3	-4	7	-9	12	

$3x^3 - 4x^2 - 7x - 9 + \frac{12}{x+2}$

3

2	0	4	-5
6	18	66	
3	6	22	61

$2x^2 + 6x + 22 + \frac{61}{x-3}$

4

2	3	4	0	-2	7	-13
	6	20	40	76	166	
3	10	20	38	83	153	

$f(2) = 153$

5

-2	1	2	-7	-20	-12
	-2	0	14	12	
1	0	-7	-6	0	

3	1	0	-7	-6
	3	9	6	
1	3	2	0	

$x^2 + 3x + 2$
 $(x+2)(x+1) = 0$

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

6. $f(x) = x^3 - 19x + 30$ $k = -5$

-5	1	0	-19	30
	-5	25	-20	
1	-5	6	0	

$x^2 - 5x + 6 \rightarrow (x-2)(x-3)$

Zeros: $-5, 2, 3$

7. $f(x) = a(x-3)(x-1)(x+2)$

$8 = a(2-3)(2-1)(2+2)$

$8 = -4a$

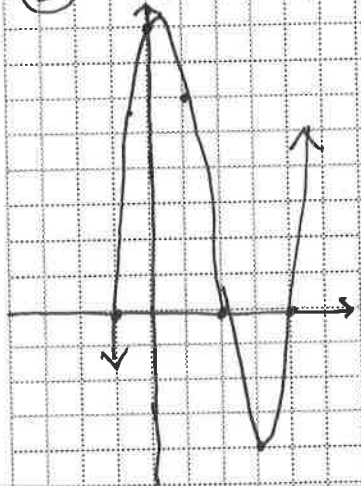
$-2 = a$

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

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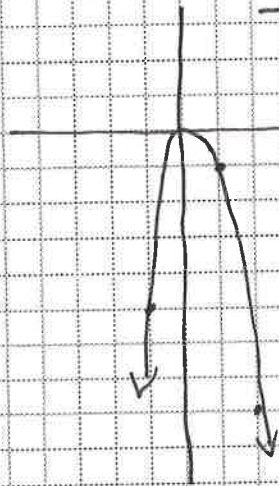
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⑧ ZEROS: -1, 2, 4 Y-INT (0, 8)



TEST PTS:
 $f(1) = 6$
 $f(3) = -4$

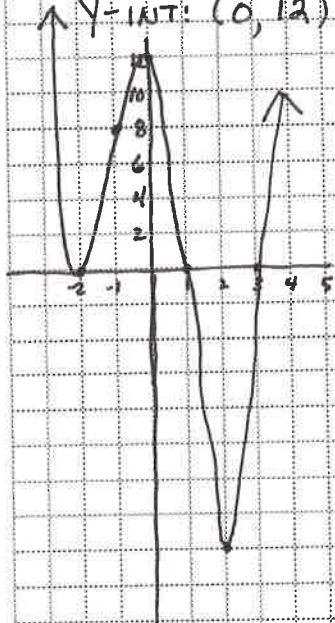
⑨ $f(x) = -x^4 + 2x^3 - 2x^2$



$-x^2(x^2 - 2x + 2)$
 $-x^2 = 0 \implies x = 0$
 $x^2 - 2x + 2 = 0 \implies x = \frac{2 \pm \sqrt{4-8}}{2}$
2 NOT REAL

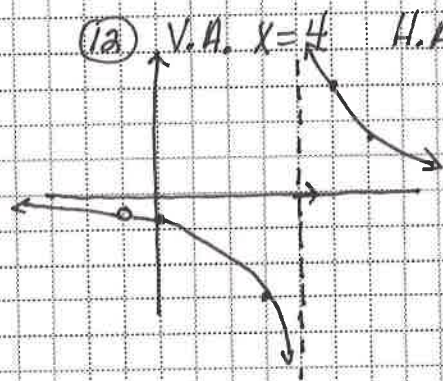
TEST PTS
 $f(-1) = -5$
 $f(-2) = -40$
 $f(1) = -1$
 $f(2) = -8$

⑩ ZEROS: 1, 3, -2 w/multiplicity 2 Y-INT: (0, 12)



TEST PTS:
 $f(-1) = 8$
 $f(-3) = 24$
 $f(2) = -16$
 Bounce @ -2

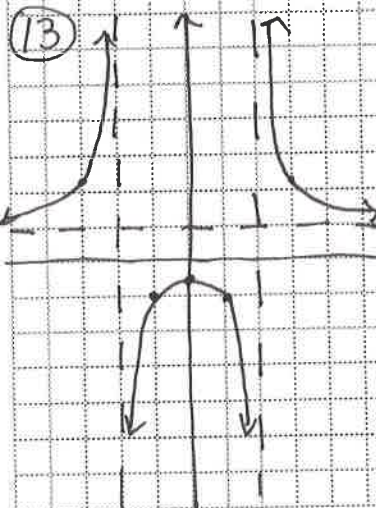
⑪ $f(x) = \frac{(x-5)(x-3)}{(x-2)^2}$



⑫ V.A. $x=4$ H.A. $y=0$ HOLES: $x=-1$
 Y-INT: $(0, \frac{3}{4})$ $\frac{3(x+1)}{(x+1)(x+4)}$

No X-INT
 TEST PT
 $f(3) = -3$
 $f(5) = 3$
 $f(6) = \frac{3}{2}$

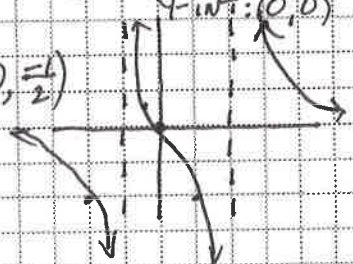
⑬ VA $x=0$ H.A. NONE: Oblique Asympt. DO NOT GRAPH



VA: $x=2$ $x=-2$
 H.A. $y=1$
 No holes
 No x-int, Y-int $(0, \frac{1}{2})$

TEST PTS:
 $f(-3) = \frac{11}{5}$
 $f(-1) = -1$
 $f(1) = -1$
 $f(3) = \frac{11}{5}$

⑭ V.A. $x=2$ $x=-1$ H.A. $y=0$ X-int: $(1, 0)$



TEST PTS: $f(-2) = -2$
 $f(-\frac{1}{2}) = 1.6$
 $f(1) = -2$
 $f(3) = 3$

⑮ VA $x=3$ $x=3$ H.A. $y=0$



X-int $(-1, 0)$
 Y-int $(0, -\frac{1}{3})$

TEST PTS: $f(-4) = -.43$ $f(4) = .71$
 $f(-2) = .2$
 $f(1) = -.25$

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(17) $y = \frac{.47(96)}{100.5 - 96} = \frac{45.12}{4.5}$ 10.03 hours of study

(18) $r = k m n^2$ $r = \frac{1}{2} m n^2$
 $72 = k \cdot 4 \cdot 36$ $\frac{1}{2} (3)(4)^2$
 $\frac{1}{2} = k$ $r = 24$

(19) $p = \frac{k}{q^2}$ $p = \frac{1}{q^2}$
 $4 = \frac{k}{(\frac{1}{2})^2}$ $p = \frac{1}{(\frac{3}{2})^2}$
 $1 = k$ $p = \frac{4}{9}$

(20) $y = k z^2$ $y = \frac{2}{9} z^2$
 $8 = k \cdot 6^2$ $y = \frac{2}{9} (9)^2$
 $\frac{2}{9} = k$ $y = 18$