Name _____

Algebra 2 & Trig Honor Final Exam Review Problems & Answers

Matrices (Chapter 4)

○ p.166-169	# 4, 5, 8
○ p.174-175	# 9, 13
○ p.182-184	# 8, 9, 11, 15, 55
○ p.199-200	# 1, 14, 15, 18
○ p.205-207	ON CALC # 21, 22, 29
○ p.213-214	ON CALC # 4, 10, 14, 25

Quadratics (Chapter 5)

1. Find the *x*-intercepts, *y*-intercept and vertex of each quadratic below.

(a) $y=-2(x-3)(x-5)$ (b) $y=4(x-3)^2-9$ (c) $y=4x^2-16x+7$

2. Solve $x^2-4x-60=0$ by…

(a) factoring (b) completing the square

(c) quadratic formula (d) graphing $y=x^2-4x-60$ on the calculator and using CALC ZEROES

3. Find all points where the parabolas $y=2x^2-11x+10$ intersects the parabola $y=-x^2+3x+2$ …

(a) By hand. Don't forget to plug in to find the *y*-coordinate!

(b) By graphing on the calculator.

○ p.237-239	# 16 (use the calculator), 35
○ p.244-245	# 13, 15 (graph by hand), 54 (a), (b) 57, 67,
○ p.251-253	# 1, 9, 27, 33, 37, 43, 52
○ p.274-275	# 1, 8, 16, 18, 29, 33, 37, 50, 61, 65,
○ p.281	# 23, 32, 40
○ p.289	# 3, 9, 14, 31, 32

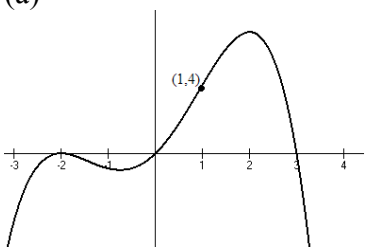
Polynomials (Chapter 6)

1. Factor each polynomial completely and sketch their graphs.

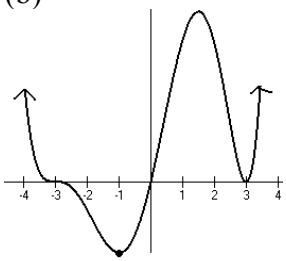
(a) $y=2x^3+4x^2-18x-36$ (b) $y=4x^5-24x^4+36x^3$

2. Write an equation for each polynomial

(a)



(b)



(-1, -24)

○ p.303-304	# 12, 13 (calculator) 44, 48, 57
○ p.311-313	# 27, 28, 30, 36, 43, 44
○ p.318	# 5, 6, 14, 26, 48
○ p.324-326	# 13, 14, 15, 21, 52, 54
○ p.333	# 2, 13, 14, 17, 19, 22
○ p.337	# 7, 15

Functions (Some of chapter 2 and 7)

1. Write the domain of each function below.

(a) $f(x)=\dfrac{x}{x^2-10x+16}$ (b) $g(x)=\sqrt{x-2}$ (c) $g(x)\dfrac{1}{\sqrt{x-2}}$ (d) $h(x)=\sqrt{10-x}-\sqrt{x-5}$

2. Write the domain and range of each function below.

(a) $f(x) = x^2 - 6x - 7$ (b) $f(x) = 2 - |x - 3|$ (c) $5 - 3\sqrt{4x - 8}$

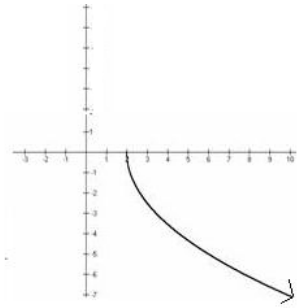
3. $f(x)$ is graphed below

Sketch graphs of

(a) $f(-x)$

(b) $-f(x)$

(c) $f^{-1}(x)$



4. If $f(x) = \dfrac{2x}{x-3}$

(a) Find $f(f(4))$

(b) Solve $f(a) = \frac{1}{2}$

(c) Find $f^{-1}(x)$

(d) Find the domain & range of both $f(x)$ & $f^{-1}(x)$

○ p.59-60	# 12, 35, 38, 43, 45, 50-54
○ p.88-89	# 40, 41,
○ p.362	# 51-55, 63, 64
○ p.366	# 28, 48, 52
○ p.371-372	#18, 20, 21, 25, 27, 31
○ p.376-377	# 3, 5, 6, 14, 19, 22
○ p.382-383	# 23, 25, 37
○ p.389	# 13, 20, 21, 26, 28, 48
○ p.395 -396	# 8, 17, 23, 34, 41
○ p. 404-405	# 12, 22, 31, 32, 34, 38, 42, 46, 48, 66, 71
○ p. 411-412	# 25, 37, 40, 41, 43

Exponential and Logarithmic Functions (Chapter 8)

○ p.426-427	# 1, 19, 37, 42, 46,
○ p.434-435	# 8, 9, 15, 25, 39, 40,
○ p.442-443	# 6, 14-25, 35, 39, 53, 63, 67, 71,
○ p.449-450	# 11, 13, 18, 19, 21, 26
○ p.456-458	# 11, 33, 44, 93 ,95
○ p.464-465	# 2, 6, 15, 31-35

Rational Functions (Chapter 9)

1. Suppose that y is directly proportional to the square of z and inversely proportional to the square root of x. Additionally, $y = 4$ when $x = 9$ and $z = 6$. Find y when $x = 36$ and $z = 12$.
2. Billy biked for 1hr12min at a pretty spunky pace. He then biked another 36 min, but slowed down to ½ his original speed. He went a total of 30 miles. Write an equation that, if solved, would tell you his spunky pace.
3. Mary typically rows 6 miles/hour in still water. Today she rowed 10 miles in a river whose current increased that speed. She turned around and rowed back with that current decreasing her speed. The total trip took 7 hrs30 min. Write an equation that, if solved, would tell you the speed of the water.
4. Working individually, it takes Rob 3 hours longer than Katie to write a television sitcom episode. Working together they can write ½ an episode in 2 hours. Write an equation that could determine how long it would take to Katie write one if working alone.
5. It takes one Jimmy 8 hours to do a certain job alone. After Jimmy worked for 3 hours on the job, Timmy joined him and they completed the job in 2 more hours. How long would it take Timmy to do the job himself?

○ p.481	# 1, 13, 40, 46
○ p.495-496	# 5, 6,10,13, 14, 19-24
○ p.501	# 1, 5,11, 15
○ p.508	#32, 34, 48
○ p.514-517	# 41, 44, 48

Trigonometry (Chapters 13 & 14)

You should remember all this stuff pretty well. Just look over your last couple tests and quizzes.

Chapter 4 Review Problems Answers

p.166 -169 #4 2 *by* 3 #5 4 *by* 1 #8 7 **p.174-175** #9 $\begin{bmatrix} -6.8 & 1.3 \\ -2.1 & -1 \end{bmatrix}$ #13 $\begin{bmatrix} -4 & -1 \\ -1 & -2 \end{bmatrix}$

p.182-184 #8 $\begin{bmatrix} 21 & 3 \\ 2 & 16 \\ 7 & -25 \end{bmatrix}$ #9 $\begin{bmatrix} 8 & -2.5 \\ -1.5 & -1 \end{bmatrix}$ #11 $\begin{bmatrix} 5 & -12 \\ 9 & -6 \end{bmatrix}$ #15 $\begin{bmatrix} 34 & 0 \end{bmatrix}$ #55 $x = -3$, $y = -9$

p.199-200 #1 Yes! They multiply to $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ #14 $\begin{bmatrix} 0 & 1 \\ -1 & -2 \end{bmatrix}$ #15 $\begin{bmatrix} -1 & 3 \\ 1 & -2 \end{bmatrix}$ #18 It has no inverse ☹

p.205-207 #21 1 #22 $\begin{bmatrix} -4 & -3.5 & 2 \\ -5 & -5 & 3 \\ 2 & 2 & -1 \end{bmatrix}$ #29 $\begin{bmatrix} 10 \\ 3 \\ -2 \end{bmatrix}$

p.213-214 #4 coefficient matrix = $\begin{bmatrix} 1 & 3 & -1 \\ 1 & 0 & 2 \\ 0 & 2 & -1 \end{bmatrix}$, constant matrix = $\begin{bmatrix} 2 \\ 8 \\ 1 \end{bmatrix}$, variable matrix = $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$,

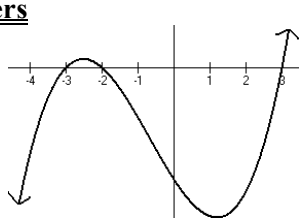
#10 (1,-1) #14 (-3, -2, 18) #25 (16,-22)

Chapter 5 Review Problems Answers

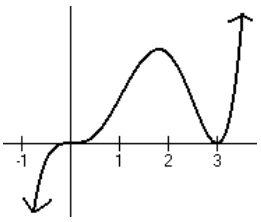
#1 (a) x-int: 3,5 y-int: -30, vert: (4,2) (b) x-int: 4.5, 1.5 y-int: 27, vert: (3,-9) (c) x-int: 3.5, .5, y-int: 7 vert: (2,-9)
#2 x = -6 and 10 #3 (4, -2) and (2/3, 32/9) **p.237-239** #16 $y = -x^2 + 3x - 4$ #35 $c = -11/8$
p.244-245 #13 x-int: -3, y-int: 9, vert: (-3,0) #15 x-int: 0, -2, y-int: 0, vert: (-1,-2) #54 (a) \$20 (b) \$6050
#57 $y = x^2 + 1$ #67 a = -6, b = 24 **p.251-253** #1 x-int: none, y-int: 3, vert: (1,2), axis: x = 1
#9 x-int: 3 & -1 y-int: 3, vert: (1,4), axis: x =1 #27 $y = (x-2)^2 + 2$ #33 $y = 2(x - \frac{5}{4})^2 + \frac{71}{8}$
#37 x-int: just 2 y-int: -12, vert: (2,0), axis: x = 2 , #43 $y = -7(x-1)^2 + 2$ #52 $y = -9x^2 + 24x - 10$
p.274-275 #1 $2i$ #8 $9i$ #16 $2 + i$ #18 $4 + 6i\sqrt{2}$ #29 $6 + 3i$ #33 $10 + 6i$ #37 $9 + 58i$ #50 $\pm i\sqrt{65}$ #61 $11 - 5i$ #65 $-27 + 8i$ **p.281** #23 $2 \pm \frac{\sqrt{15}}{3}$ #32 $y = 2(x-2)^2 - 7$ #40 ± 10 **p.289** #3 1 or -7/2 #9 $\frac{2 \pm \sqrt{10}}{3}$ #14 $1 \pm 2i$ #31 D= -4 ; Two imaginary solutions #32 D= 36 ; Two real solutions. Actually rational, since 36 is a square.

Chapter 6 Review Problems Answers

#1 (a) $y = 2(x-3)(x+3)(x+2)$



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



=#2 (a) $y = -\frac{2}{9}x(x-3)(x+2)^2$ 2 (b) $y = -\frac{3}{16}x(x+3)^3(x-3)^2$ **p.303-304** #12 $y = -x^4 + 3x^3$, deg 4, 2 terms (binomial)
#13 $y = x^3 + 1$ #44 $y = 2x^3 - 2x^2 + 8x - 27$ #48 $y = 2a^3 - 5a^2 - 2a + 5$ (polynomial
#57 $y = 8c^3 - 26c + 12$ (trinomial) **p.311-313** #27 $x^3 - 2x^2$ #28 $2x^3 - 7x^2 - 4x$ #30 0 mult 1, 1 mult 3
#36 -1 mult 2, 1 mult 1, 2 mult 1. #43 $3x(x-8)(x-1)$ #44 $-2x(x+5)(x-4)$ **p.318** #5 $3x^3 - 7x + 2$, R = 0
#6 $9x - 12$, R = -32 #14 $x^2 - 2x + 2$, R = 0 #26 18 #48 yes! Divide and the remainder turns out to be zero!
p324-326 #13 $(x-10)(x^2 + 10x + 100)$ #14 $(5x-3)(25x^2 + 15x + 9)$ #15 $x = 3, \frac{-3 \pm 3i\sqrt{3}}{2}$ #21 $(x^2 - 7)(x-1)(x+1)$
#52 $0, -\frac{3}{2}, 4$ #54 $-3, -2, 2$ **p333** #2 Possible; $\pm 1, \pm 2, \pm 3, \pm 6$ Actual; $1, -2, -3$

#13 $-\sqrt{5},\sqrt{13}$ #14 $4+\sqrt{6},-\sqrt{3}$ #17 $2-3i,\ -6i$ #19 $x^3-x^2+9x-9=0$ #22 $x^3-3x^2-8x+30=0$

p337 #7 6 complex roots; 0,2,4, or 6 real roots; potential rational roots are $\pm1,\pm7,\pm\frac{1}{2},\pm\frac{7}{2}$ #15 $x=0,\dfrac{3\pm3\sqrt{5}}{2}$

Chapter 7 Review Problems Answers

#1 (a) All x except 8 and 2 (b) All $x\ge2$ (c) All $x>2$ (d) All $5\le x\le10$

#2 (a) D: all x, R: $y\ge-16$ (b) D: All x, R: $y\le2$ (c) D: $x\ge2$, R: $y\le5$

#3 (a) Reflect over y-axis (b) Reflect over x-axis (c) Reflect over the line $y=x$

#4 (a) 16/5 (b) x = -1 (c) $y=\frac{3x}{x-2}$ (d) $\boxed{f(x)}$ D: All $x\ne3$, R: All $y\ne2$ $\boxed{f^{-1}(x)}$ D: All $x\ne2$ R: All $y\ne3$

p.59-60 #12 not a function #35 D:$\{-\frac{3}{2},\ \frac{1}{2},\ \frac{3}{2},\ \frac{5}{2},\}$ R:$\{-\frac{1}{2},\ \frac{1}{2}\}$, it is a function!

#38 D: All x, R: All $y\ge0$, function! #43 function! #45 not a function! #50 -3 #51 $-\frac{2}{3}$ #52 $-4x-14$

#53 7 #54 $\frac{3}{4}$ **p.88-89** #40 slope 1, V = (3,0) opens down. #41 slope 2, V = (-3,0) opens up

p.362 #3 $16x^6y^{10}$ #5 $4a^3$ #6 $2x^8y^5$ #14 $18y^5$ #19 $\frac{t^8}{s}$ #22 $\frac{x^6y^4}{9}$ **p.366** #23 x^4y^9 #25 $-4a$

#37 $\sqrt[3]{-64}<\sqrt[6]{64}<-\sqrt[3]{-64}<\sqrt{64}$ **p.371-372** #13 $3y^3\sqrt[3]{2y}$ #20 $40xy\sqrt{3}$ #21 $30y^2\sqrt[3]{2y}$ #26 $5x\cdot\sqrt[3]{x^2y^2}$

#28 $\frac{\sqrt{10x}}{4x}$ #48 $\frac{\sqrt[3]{3x^2}}{3x}$ **p.376-377** #8 $13\sqrt{5}$ #17 $49+12\sqrt{13}$ #23 $-2+2\sqrt{3}$ #34 $8+\sqrt{10}$ #41 $\frac{\sqrt{3}-\sqrt{7}}{2}$

p.382-383 #12 $\sqrt[7]{x^2}$ #22 $a^{\frac{2}{3}}$ #31 16 #32 4 **#34** $\frac{1}{16}$ #38 $\frac{1}{x^2}$ #42 $-\frac{3}{x^3}$ #46 $\frac{y^4}{x^3}$ #48 x^3y^9 **#66** $y^{\frac{4}{5}}$ **#71** $\frac{9y^8}{4x^6}$

p.389 #25 2 (not -3) #37 No solution (not 23) #40 6.5 #41 -7 or 9 #43 9 **p.395-396** #51 $-3x^2+2x+16$, D: All x

#52 $3x^2-12$, D: All x #53 $3x^3+8x^2-4x-16$, D: All x #54 $-9x^3-24x^2+12x+48$, D: All x #55 $\frac{3x^2+2x-8}{x+2}$ D-All $x\ne-2$ #63 $3x^2$ & $9x^2$ #64 $x-2$ & $x-2$

p.404-405 #28 $f^{-1}(x)=\pm\sqrt{1-x}$ $\boxed{f(x)}$ D: All x, R: All $y\ge-1$ $\boxed{f^{-1}(x)}$ D: All $x\ge-1$, R: All y

#48 $f^{-1}(x)=(x-3)^2$ for $x\ge3$ $\boxed{f(x)}$ D: All $x\ge0$, R: All $y\ge3$ $\boxed{f^{-1}(x)}$ D: All $x\ge3$, R: All $y\ge0$

#52 $f^{-1}(x)=\pm\frac{1}{\sqrt{x}}$ $\boxed{f(x)}$ D: All $x\ne0$, R: All $y\ne0$ $\boxed{f^{-1}(x)}$ D: All $x\ne0$, R: All $y\ne0$

p.411-412 #18 left 1, up 4, points up & right, a little steep. #31 left 2, points down & right, a bit steep. Check rest of problems on the calculator.

Chapter 8 Review Problems Answers

p.426-427 #1 Asymptote y =0 ; Points: (-1, $\frac{1}{6}$), (0, 1), (1, 6) & (2, 36) #19 decay #37 63% increase #42 75% decrease

#46 1.7 **p.434-435** #8 Asymptote y =0 ; Points: (-2, -9), (0, -1), (1, $-\frac{1}{3}$) #9 Asymptote y =5 ;

Points: (-1, $4\frac{7}{8}$), (0, 6), (1,13) #15 .85mg #25 \$448.30 #39 (a) $8.511(1.038)^t$ (b) = 16.655- almost doubles (c) = 11.906 40% growth #40 (a) 2501.50 (b) 2504.65 **p.442-443** #6 $\log_7 49=2$ #14 4 #15 $\frac{1}{2}$ #16 1 #17 $\frac{3}{2}$ #18 3 #19 $\frac{1}{2}$ #20 none **#21** 2 #22 5 #23 1 #24 4 #25 3 #35 Asymptote x =0 ;

Points: (1,0), (4, 1), (16,2) , ($\frac{1}{4}$,-1) #39 Asymptote x =2 ; Points: (3,0), (10,1), (52, 2) #53 $128=2^7$

#63 $y=4^x$ #67 $y=10^x-1$ #71 $y=3^{\frac{1}{x}}$ **p.449-450** #11 $\log14$ #13 $\log972$ #18 $\log_7\frac{xy}{z}$ #19 $3\log x+5\log y$

#21 $\log_4 5+\frac{1}{2}\log_4 x$ #26 $2\log a+3\log b-4\log c$ **p.456-458** #11 3.1699 #33 .05 #44 5 #93 1.0451

#95 1.3063 **p.464-465** #2 $\ln18$ #6 $\ln1=0$ #15 e^{-2} #31 1 #32 2 #33 10 #34 10 #35 0

Chapter 9 Review Problems Answers

1) 8 $\left(y=\dfrac{1}{3}\cdot\dfrac{z^2}{\sqrt{x}}\right)$ 2) $x\cdot\left(\dfrac{6}{5}\right)+\dfrac{1}{2}x\cdot\left(\dfrac{3}{5}\right)=30$ 3) $\dfrac{10}{6+x}+\dfrac{10}{6-x}=7.5$ 4) $\dfrac{2}{x}+\dfrac{2}{x+3}=\dfrac{1}{2}$ 5) $5\dfrac{1}{8}+2\dfrac{1}{x}=1$

p.481 #1 $y=\frac{11}{x}$ #13 10 #40 5.4 #46 15 **p.495-496** #5 vertical asymptote when x = -3 #6 vertical asymptote when x = -3.5 or 1 #10 vertical asymptote when x = -2 #13 vert x = -1, hole at (2, 5/3)

#14 hole at (-2, -4) #19 horiz y = 0 #20 horiz y = 0 #21 horiz y = 1 #22 horiz y = ½ #23 y = 0

#24 $y = \frac{3}{4}$ **p.501** #1 $\frac{1}{2x-1}$ #5 $\frac{2}{x+5}$ #11 $\frac{x-2}{x(x-1)}$ #15 $\frac{5(x+y)}{3}$ **p.508** #32 $\frac{x^2+4x-3}{(x-1)(x+1)}$ #34 $\frac{7x-17}{(x-3)(x+3)}$ #48 $\frac{2(x+5)}{x+7}$ **p.514-517**

#41 No solution (not $b = 1$) #44 $x = \frac{38}{21}$ #48 $x = -4$