Algebra 2/Trig
1st Semester Final Exam Review problems (cont.)

Chapter 5 Review:

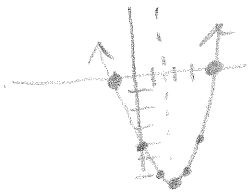
p. 945 # 3, 4, 8, 14-16, 19, 24, 35, 42, 43, 58-60, 65, 68, 71, 82, 86, 102

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

V(-3,-4)

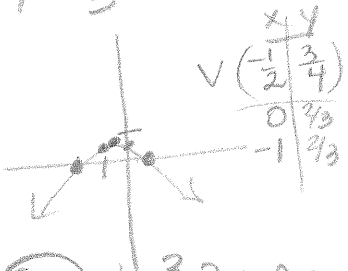
x	y
-2	-3
-4	-3
-1	0
-5	0

(4) $y=(x+1)(x-4)$



x	y
1	-6
2	-6
0	-4
3	-4
$\frac{3}{2}$	$-\frac{25}{4}$ V

(8) $y=-\frac{1}{3}(x+2)(x-1)$



x	y
$-\frac{1}{2}$	$\frac{3}{4}$ V $\left(-\frac{1}{2},\frac{3}{4}\right)$
0	$\frac{2}{3}$
-1	$\frac{2}{3}$

(14) $9a^2-5ka+12$
$(9a-2)(a-6)$

(15) $4u^2-4u-35$
$(2u+5)(2u-7)$

(16) n^2-49
$(n+7)(n-7)$

(19) $4x^2-2x-20$
$2(2x^2-x-10)$
$2(2x-5)(x+2)$

(24) $3x^2-24x-27=0$
$3(x^2-8x-9)=0$
$(x-9)(x+1)$
$9, -1$

(35) $y=5x^2-13x+6$
$y=(5x-3)(x-2)$
zeros: $\frac{3}{5}$, 2

(42) $\sqrt{15}\cdot\sqrt{3}=\sqrt{45}=3\sqrt{5}$

(43) $\sqrt{\frac{81}{125}}=\frac{\sqrt{81}}{\sqrt{125}}=\frac{9}{5\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}=\frac{9\sqrt{5}}{25}$

(58) $\sqrt{(y-3)^2}=\sqrt{-49}$
$y-3=\pm 7i$
$y=3\pm 7i$

(59) $6x^2=-216$
$\sqrt{x^2}=\sqrt{-36}$
$x=\pm 6i$

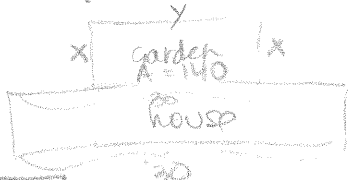
(60) $4(x+5)^2=-8$
$\sqrt{(x+5)^2}=\sqrt{-2}$
$x+5=\pm i\sqrt{2}$
$x=-5\pm i\sqrt{2}$

(65) $(15-7i)-(15-7i)$
0

(68) $(9-2i)(9+2i)$
$81-4i^2$
$81+4$
85

(71) $\frac{3}{5+i}\cdot\frac{5-i}{5-i}=\frac{15-3i}{25-i^2}$
$\frac{15-3i}{26}=\frac{15}{26}-\frac{3i}{26}$

(82)



155 ft × 90 ft

$2x+y\le 40 \Rightarrow y\le -2x+40$
$xy\le 140$
$x(-2x+40)\le 140$
$-2x^2+40x-140\le 0$
$-2(x^2-20x+70)\le 0$
$-(-20)\pm\sqrt{(-20)^2-4(1)(70)}$ / $2(1)$
$\frac{20\pm\sqrt{120}}{2}$
$x\approx 15.5$ or ~~45~~

(86) $x^2-4x+5=0$
$-(-4)\pm\sqrt{(-4)^2-4(1)(5)}$ / $2(1)$
$\frac{4\pm\sqrt{-4}}{2}$
$\frac{4\pm 2i}{2}$
$2\pm i$

(102) V(1,2)
point (2,4)
$y=a(x-h)^2+k$
$4=a(2-1)^2+2$
$2=a$
$y=2(x-1)^2+2$

p. 318 # 1, 2, 4, 5, 8

(1) B
(2) E
(4) C
(5) D
(8) B

Chapter 6 Review:

p. 947 # 17, 22, 47, 50, 51, 58, 61, 65, 74, 77

(17) $(6x^3y^4)^{-2}$

$6^{-2}x^{-6}y^{-8}$

$\frac{1}{36x^6y^8}$

(22) $\frac{2x^{-3}y^{-5}}{3x^{-6}y^{-3}}$

$\frac{2}{3}x^3y^{-2} = \frac{2x^3}{3y^2}$

(47) $(2x+8)^3$

$8x^3+96x^2+384x+512$

(50) x^3-27

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

(51) $2x^3+250$

$2(x^3+125)$

$2(x+5)(x^2-5x+25)$

(58) $3x^5+6x^3-45x$

$3x(x^4+2x^2-15)$

$3x(x^2+5)(x^2-3)$

(61)

4	1	−10	27	−12
	↓	4	−24	12
	1	−6	3	0

x^2-6x+3

(65)

2	4	−5	2	−1	5
	↓	8	6	16	30
	4	3	8	15	35

$4x^3+3x^2+8x+15+\frac{35}{x-2}$

(74)

−1	1	1	9	9
	↓	−1	0	−9
	1	0	9	0

$x^2+9=0$

$\sqrt{x^2}=\sqrt{-9}$

$x=\pm 3i$

$-1, \pm 3i$

(77)

1	1	0	−6	0	5
	↓	1	1	−5	−5
−1	1	1	−5	−5	0
	↓	−1	0	5	
	1	0	−5	0	

$x^2-5=0$

$x^2=5$

$x=\pm\sqrt{5}$

$\pm 1, \pm\sqrt{5}$

p. 392 # 3, 5, 7-9, 10

(3) A

(5) E

(7) B

(8) E

(9) E

(10) D

Chapter 7 Review:

p. 949 # 20, 27, 41, 42, 51, 52, 65, 66, 72, 76

(20) $\frac{\sqrt{10}}{\sqrt[4]{10}} = \frac{10^{\frac{1}{2}}}{10^{\frac{1}{4}}} = \frac{10^{\frac{2}{4}}}{10^{\frac{1}{4}}} = 10^{\frac{1}{4}} = \boxed{\sqrt[4]{10}}$

(27) $\sqrt[3]{\frac{8x^6y^{12}}{27}} = \frac{\sqrt[3]{8}\sqrt[3]{x^6}\sqrt[3]{y^{12}}}{\sqrt[3]{27}} = \boxed{\frac{2x^2y^4}{3}}$

(41) $f(g(x))$

$3(x^{1/2})^{1/3}$

$3x^{\frac{1}{6}}$

D: nonnegatives

(42) $g(f(x))$

$(3x^{1/3})^{1/2}$

$3^{1/2}x^{1/6}$

D: nonnegatives

(51) $f(x) = \frac{1}{2}x - 4$

$x = \frac{1}{2}y - 4$

$2x = y - 8$

$\boxed{2x + 8 = f^{-1}(x)}$

(52) $f(x) = 3x^3 + 2$

$x = 3y^3 + 2$

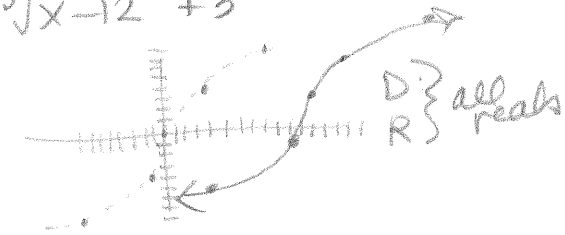
$x - 2 = 3y^3$

$\sqrt[3]{\frac{x-2}{3}} = \sqrt[3]{y^3}$

$\frac{\sqrt[3]{x-2}}{\sqrt[3]{3}} \cdot \frac{\sqrt[3]{9}}{\sqrt[3]{9}} = \boxed{\frac{\sqrt[3]{9x-18}}{3} = f^{-1}(x)}$

(65) $y = 4\sqrt[3]{x-12} + 3$

x	y
-8	-8
-1	4
0	4
1	8
8	8

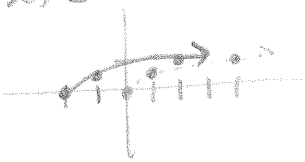


D: all reals

R: all reals

(66) $y = \frac{1}{2}\sqrt{x+2}$

x	y
-2	0
-1	1/2
2	1



D: $x \geq -2$

R: $y \geq 0$

(72) $2(x+1)^{2/3} = 6$

$[(x+1)^{2/3}]^{3/2} = [3]^{3/2}$

$x + 1 = \pm\sqrt{27}$

$\boxed{x = -1 \pm \sqrt{27}}$

$\boxed{4.2, -6.20}$

(75) $\sqrt[3]{x} + 4 = 2$

$(\sqrt[3]{x})^3 = (-2)^3$

$\boxed{x = -8}$

p. 460 # 2, 3, 5-8

(2) A

(3) D

(5) B

(6) C

(7) C

(8) E

Chapter 8 Review:

p. 950 # 24-28, 43, 45, 50, 53

(24) $(7e^{-x})^{-2}$

$7^{-2}e^{2x}$

$\boxed{\frac{e^{2x}}{49}}$

(25) $\frac{10e^{x}}{e^{3x}} = 10e^{-2x}$

$\boxed{\frac{10}{e^{2x}}}$

(26) $\sqrt[3]{64e^{6x}}$

$\sqrt[3]{64}\cdot\sqrt[3]{e^{6x}}$

$\boxed{4e^{2x}}$

(27) $e^{2x}\cdot e^{4x-1}$

$\boxed{e^{6x-1}}$

(28) $\frac{e^{x}}{5e} = \boxed{\frac{e^{x-1}}{5}}$

(43) $\log_5 25 = \boxed{2}$

(45) $\log_{x} 2$

$\frac{1}{4}^{x} = 2$

$2^{-2x} = 2$

$-2x = 1$

$x = \boxed{-\frac{1}{2}}$

(50) $y = \log_4 x$

$x = \log_4 y$

$\boxed{4^{x} = y}$

(53) $y = \ln 3x$

$x = \ln e^{3y}$

$e^{x} = 3y$

$\boxed{y = \frac{1}{3}e^{x}}$

p. 524 # 5-8 all

(5) $f(x) = 5\left(\frac{3}{4}\right)^{x}$ exp. decay

(6) $f(x) = 2\left(\frac{5}{4}\right)^{x}$ exp. growth

(7) $f(x) = 3(6)^{-x}$ exp. decay

(8) $f(x) = 4(3)^{x}$ exp. growth

p. 527 # 31, 32 (also solve this problem if it was compounded monthly)

(31) $V = 24900(1-.10)^{t}$

$V = 24900(.90)^{t}$

$12450 = 24900(.90)^{t}$

$6.58 \approx t$

(32) $A = 4000e^{.07(5)}$

$= \$5676.27$

(32) compounded monthly

$A = 4000\left(1+\frac{.07}{12}\right)^{12(5)}$

$\$5670.50$