Math 012 Final Examination
Answer Sheet

Fall 2017

Math 012 Intermediate Algebra

Final Examination: Fall 2017

Answer Sheet

Name GEOFFREY WINSBRO

Instructor ABDELLAH DAKHAMA

Very Good. 95/100

Instructions:

This is an open-book exam. You may refer to your text and other course materials as you work on the exam and you may use a calculator. Record your answers and show your work on this document. **You must show your work to receive credit: answers given with no work shown will not receive credit.** You may type your work using plain-text formatting or an equation editor, or you may hand-write your work and scan it. If you choose to scan your work, note that most scanners have a setting that will allow you to create one PDF document from all of the pages of your Answer Sheet – please make use of this option if it is available on your scanner. Whether you type your work or write it by hand, show work neatly and correctly, following standard mathematical conventions. Each step should follow clearly and completely from the previous step. If necessary, you may attach extra pages.

You must complete the exam individually. Neither collaboration nor consultation with others is allowed. Your exam will receive a zero grade unless you complete the following honor statement.

Please sign (or type) your name below the following honor statement:

I have completed this final examination myself, working independently and not consulting anyone except the instructor. I have neither given nor received help on this final examination.

Name 

Date 20171215

Problem Number	Solution
1	WORK: $5(1-\frac{1}{5}x) = -6(x+2)+5$ $5-5x = -6x-12+5$ $5-5x = -6x-7$ $+6 \quad +6 \quad -5$ $x \qquad -12$ ANSWER: $x = -12$
2	WORK: $\frac{44}{15} = -\frac{1}{2}x - \frac{4}{3}x$ $-\frac{1}{2}x - \frac{4}{3}x = \frac{44}{15}$ $x\left(-\frac{1}{2} - \frac{4}{3}\right) = \frac{44}{15}$ $x\left(-\frac{3}{6} - \frac{8}{6}\right) = \frac{44}{15}$ $-\frac{11}{6}x = \frac{44}{15}$ $(-6)\frac{11}{6}x = \frac{44}{15}(-6)$ $\frac{11x}{11} = -\frac{\frac{88}{5}}{11}$ $x = -\frac{8}{5}$ ANSWER: $x = -\frac{8}{5}$
3	WORK: $5x+8x \geq 2(\frac{1}{2}6 - \frac{7}{1}x) + 3(\frac{8}{1}x+3)$ $13x \geq -12-14x+24x+9$ $13x \geq 10x-3$ $-10x \quad -10x$ $\frac{3x}{3} \geq \frac{-3}{3}$ $[-1, \infty)$  ANSWER: $x \geq -1$

4

WORK:

$-2(a+1) > -\frac{11}{4}$

$(-1)-2(a+1) > -\frac{11}{4}(-1)$

$\frac{2(a+1)}{2} > \frac{\frac{11}{4}}{2}$

$a+1 < \frac{11}{8} - 1$

$-1 \quad -1$

ANSWER: $a < \frac{3}{8}$

$(-\infty, \frac{3}{8})$

5

WORK:

$-38 < 6n - 2 \leq 16$

$6n - 2 > -38$ $\quad +2 \quad +2$

$\frac{6n}{6} > \frac{-36}{6}$

$n > -6$

$6n - 2 \leq 16$ $\quad +2 \quad +2$

$\frac{6n}{6} \leq \frac{18}{6}$

$n \leq 3$

ANSWER: $-6 < n \leq 3$

$(-6, 3]$

6

WORK: $-\frac{8}{9} \leq -\frac{8}{3}v < \frac{8}{3}$

$(-1)-\frac{8}{3}v \geq -\frac{8}{9}(-1)$ $\quad (-1)-\frac{8}{3}v < \frac{8}{3}(-1)$

$(3)\frac{8}{3}v \geq \frac{8}{9}(3)$ $\quad (3)\frac{8}{3}v < -\frac{8}{3}(3)$

$\frac{8v}{8} \geq \frac{\frac{8}{3}}{8}$ $\quad \frac{8v}{8} < \frac{-8}{8}$

$v \geq \frac{1}{3}$ $\quad v < -1$

ANSWER: $-1 < v \leq \frac{1}{3}$

$(-1, \frac{1}{3}]$

7

$Ax + By = C$

WORK:

$y = \frac{3}{5}x + 2$

$-\frac{3}{5}$

$-\frac{3}{5}x + y = 2$

Work?

standard form

$3x - 5y = -10$ -9

ANSWER:

8

$y = mx + b$

WORK:

$7x + 3y = 15$

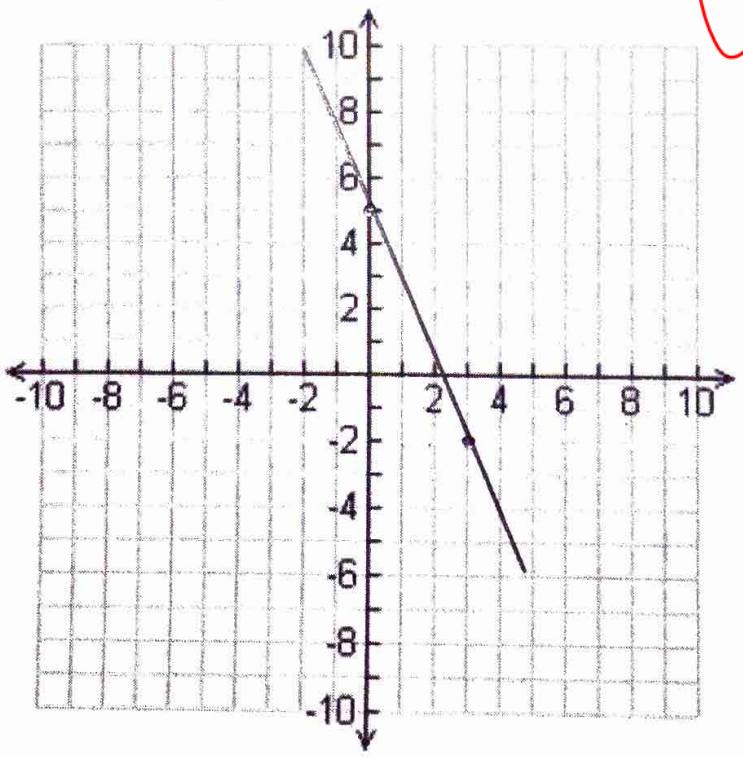
$-7x \quad -7x$

$\frac{3y}{3} = \frac{15 - 7x}{3}$

$y = \frac{15 - 7x}{3}$

$y = -\frac{7}{3}x + 5$

ANSWER: $y = -\frac{7}{3}x + 5$



$(0, 5)$

9

WORK:

$y = mx + b$ $\quad m = \frac{\Delta y}{\Delta x}$

$2008 = 55 mil$ $\quad (x, y)$

$2011 = 40 mil$ $\quad (x, y)$

$m = \frac{40-55}{2011-2008} = -\frac{15}{3} = -\frac{5}{1}$

$(2008, 55mil)$

$(2011, 40mil)$

$y = -5x + 55$

ANSWER: $y = -\frac{5}{1} + 95$

10

WORK:

$4x^4y^5 \cdot 5x^2y^2$

$4 \times 5 = 20$ $\quad 4 + 2 = 6$ $\quad 5 + 2 = 7$

$20x^6y^7$

ANSWER: $20x^6y^7$

11

WORK:

$$\frac{3x^2}{-2x^{-4}y^4 \cdot 4x^4y^2 \cdot -x^2y^4} = \frac{3x^2}{8x^{-2}y^{10}}$$

$-2 \cdot 4 \cdot -1 =$

$-8 \cdot -1 = 8$

$-4 + 4 + 2 = 2$

$4 + 2 + 4 = 10$

ANSWER: $\frac{3}{8y^{10}}$

12

WORK: $(2m^{-4}n^2)^4$

$2 \cdot 2 \cdot 2 \cdot 2$
$4 \cdot 2 \cdot 2$
$8 \cdot 2 = 16$

$\left(\frac{2n^2}{m^4}\right)^4$

$\frac{16n^8}{m^{16}}$

ANSWER: $\frac{16n^8}{m^{16}}$

13

WORK: $(2mn^4)^4 \cdot 2m^{-1}n^2$

$16m^4n^{16} \cdot 2m^{-1}n^2$

$32m^3n^{18}$

ANSWER: $32m^3n^{18}$

14

WORK:

$(7x^2 - 2x + 5x^3) - (2x^3 - 7 - 7x)$

$7x^2 - 2x + 5x^3 - 2x^3 + 7 + 7x$

$3x^3 + 7x^2 + 5x + 7$

ANSWER: $3x^3 + 7x^2 + 5x + 7$

15

WORK: $(3a+7)(8a^2-3a-2)$

$24a^3-9a^2-6a+56a^2-21a-14$

$24a^3+47a^2-27a-14$

ANSWER: $24a^3+47a^2-27a-14$

16

WORK: $5v^2-10=-23v$

$5v^2-10+23v=0$

$(5v^2-2v)+(25v-10)=0$

$(v+5)(5v-2)=0$

$v+5=0$ $\quad -5 \quad -5$

$v=-5$

$5v-2=0$ $\quad +2 \quad +2$

$\frac{5v}{5}=\frac{2}{5}$

$v=\frac{2}{5}$

ANSWER: $v=\frac{2}{5}, v=-5$

17

WORK: $m^2-22m-118=-3$

$m^2-22m=115$

$m^2-22m(-11)^2=115+(-11)^2$

$(m-11)^2=236$

$m=2\sqrt{59}+11$

$x^2+2ax+a^2=(x+a)^2$

$a=-11$

ANSWER: $m=2\sqrt{59}+11, \; m=-2\sqrt{59}+11$

18

WORK: $3x^2 - 2x = 3$

$3x^2 - 2x - 3 = \phi$

$x = \frac{(-2) + \sqrt{(-2)^2 - 4 \cdot 3(-3)}}{2 \cdot 3}$

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

$x = \frac{2 + \sqrt{40}}{6}$

$ax^2 + bx + c = 0$

$a = 3 \quad b = -2 \quad c = -3$

$\frac{2 \pm 2\sqrt{10}}{6}$

$\frac{1 + \sqrt{10}}{3}$

ANSWER: $x = \frac{1+\sqrt{10}}{3}, \; x = \frac{1-\sqrt{10}}{3}$

19

WORK: $\frac{v^2 + 12v + 35}{v^2 + 2v - 15}$

$\frac{(v+5)(v+7)}{(v-3)(v+5)}$

$\frac{(v+7)}{(v-3)}$

ANSWER: $v \neq 3, v \neq -5$

20

WORK: $\frac{r+2}{r^2 - 3r + 2} + 1 = \frac{3r}{r^2 - 3r + 2}$

$\frac{r+2}{r^2-3r+2}(r^2 - 3r + 2) + 1 \cdot (r^2 - 3r + 2) = \frac{3}{r^2 - 3r + 2}(r^2 - 3r + 2)$

$r + 2 + r^2 - 3r + 2 = 3r$

$r^2 - 2r + 4 = 3r$

$r^2 - 5r + 4 = \phi$

$(r-4)(r-1) = \phi$

ANSWER: $r = 4 \quad r \neq 2, r \neq 1$

$\frac{4+2}{4^2 - 3(4) + 2} + 1 = \frac{3(4)}{4^2 - 3(4) + 2}$

$\frac{6}{16 - 12 + 2} + 1 = \frac{12}{16 - 12 + 2}$

$\frac{6}{6} + 1 = \frac{12}{6}$

$2 = 2$

21

WORK: $\sqrt{180m^3np^4}$

$\sqrt{2^2 \cdot 3^2 \cdot 5m^3np^4}$

$2 \cdot 3mp^2\sqrt{5mn}$

ANSWER: $6mp^2\sqrt{5mn}$

22

WORK: $(-2-2\sqrt{3})(1+\sqrt{3})$

$-2-2\sqrt{3}-2\sqrt{3}-6$

$-2-4\sqrt{3}-6$

$-4\sqrt{3}-8$

ANSWER: $-4\sqrt{3}-8$

23

WORK: $n = \sqrt{4n-24}+5$

$n-5 = \sqrt{4n-24}$

$(n-5)^2 = (\sqrt{4n-24})^2$

$n^2-10n+25 = 4n-24$

$n^2-14n+49 = \phi$

$(n-7)^2 = \phi$

ANSWER: $n = 7$

$7 = \sqrt{4(7)-24}+5$

$2 = \sqrt{28-24}$

$2 = \sqrt{4}$

$2 = 2$

24

WORK:

	R	T	D
NAT	x	6	6x
JOHN	x+10	16	6x+60

$6x = 6x + 60$
$-6 \quad -6x$

$x = 60$
-10

NAT $50 \text{ mph} \cdot 6 = 130$

JOHN $(10+50) \cdot 5 = 130$

ANSWER: 50mph

25

WORK:

$A = P(1+\frac{r}{n})^{nt}$

$A = 65{,}000\left(1+\frac{.0495}{12}\right)^{12(18)}$

$A = 65{,}000(1+.004125)^{216}$

$A = 65{,}000(1.004125)^{216}$

$A = 65{,}000(2.43310)$

$A = 158{,}151.5$

ANSWER: $158,151.5