MERCER COUNTY COMMUNITY COLLEGE

MAT042

Review for Challenge Test

Mathematics Department
Fall 2013

The problems presented within these pages are meant to be representative of the material tested throughout the semester in MAT042. Solutions to these problems may be found at the end of the document.

1. Solve for *x*: $2(3x+5)=5x-11$.

   A. $x=-16$ B. $x=-21$ C. $x=2$ D. $x=-1$

2. If a television costs \$180 after a 20% discount, what was the original cost of the television?

   A. \$150 B. \$200 C. \$216 D. \$225

3. Simplify completely: $(3x^2+2x-6)-(x^2-x+2)$.

   A. $2x^4+3x^2-8$ C. $2x^2+3x-4$

   B. $2x^2+x-4$ D. $2x^2+3x-8$

4. Convert to Scientific Notation: 450,000.

   A. $4.5x10^5$ B. $4.5x10^4$ C. $4.5x10^{-5}$ D. $0.45x10^6$

5. Factor completely: $12a^2b^2-3ab$.

   A. $3ab(4ab)$ B. $3ab(4ab-1)$ C. $3ab(4a^2b^2-ab)$ D. $ab(12ab-3)$

6. Evaluate $2ab-c$ if $a=-3, b=2, c=-1$.

   A. 19 B. 18 C. – 11 D. 4

7. Which of the following is a factor of $6x^2-19x+15$?

   A. $(2x-5)$ B. $(6x+3)$ C. $(2x-3)$ D. $(x+5)$

8. Multiply and simplify: $(3x+5)(5x+1)$.

   A. $15x^2-29x+5$ C. $15x^2+28x+4$

   B. $15x^2+28x+5$ D. $15x^2-22x+4$

9. Solve for *y*: $3x+4y=12$.

   A. $y=12-3x$ B. $y=\frac{3x-12}{4}$ C. $y=3-3x$ D. $y=\frac{12-3x}{4}$

10. The sum of a number and 6 is 8 more than twice the number. Find the equation that could be used to find this number *x*.

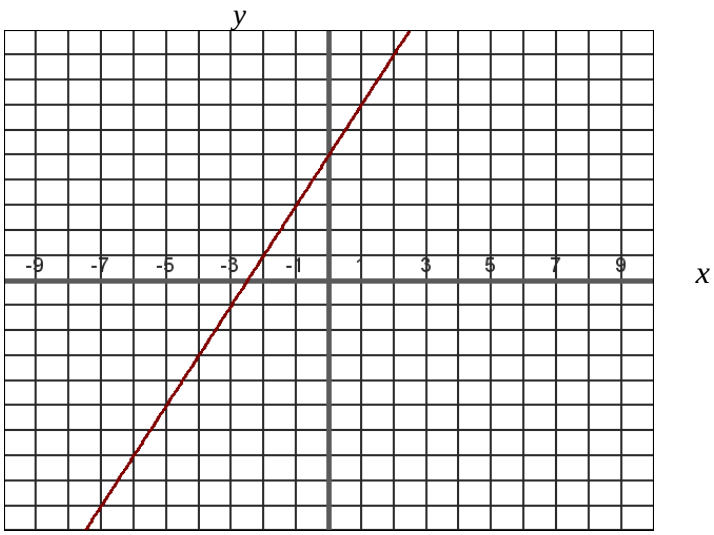
    A. $x+6=2x+8$ C. $x+6=2(x+8)$

    B. $x+6=x^2+8$ D. $6x=2x+8$

11. Find the *y*-intercept for $x + 3y = 7$.

    A. $(0,\frac{7}{3})$ B. $(0,7)$ C. $(\frac{7}{3},0)$ D. $(7,0)$

12. What is the slope of the line shown below? You may assume that each tick mark represents one unit.



A. -2 B. -3 C. 2 D. 3

13. Solve the following equation: $-2(x-6)=4$.

A. $x=-8$ B. $x=-5$ C. $x=4$ D. $x=5$

14. Simplify: $(a^2b^3)^2$.

A. a^4b^9 B. a^2b^9 C. a^4b^6 D. a^4b^5

15. Multiply: $(2-3x)^2$.

A. $4-9x^2$ B. $4-12x+9x^2$ C. $4+9x^2$ D. $4-6x+9x^2$

16. Simplify: $x^3 \bullet x^9 \bullet x^4$.

A. x^{31} B. x^{16} C. x^{12} D. x^8

17. Find the *x*-intercept for $2x-3y=6$.

A. $(0,3)$ B. $(0,-2)$ C. $(3,0)$ D. $(-2,0)$

18. Solve: $\frac{7}{10}x-1=2$.

A. $x=\frac{30}{7}$ B. $x=\frac{10}{7}$ C. $x=\frac{7}{10}$ D. $x=\frac{3}{7}$

19. Simplify: $(a^2b^{-3})^2$.

A. $-a^4b^9$ B. $-\frac{a^2}{b^9}$ C. $\frac{a^4}{b^6}$ D. a^4b^{-5}

20. Multiply: $(5m+7)^2$.

A. $5m^2+49$ B. $25m^2+70m+49$ C. $25m^2+49$ D. $5m^2+70m+49$

21. Simplify: $\frac{5x^2y}{x^3}$.

A. $5x^5y$ B. $\frac{5x}{y}$ C. $5xy$ D. $\frac{5y}{x}$

22. Solve for *y* and express the answer in interval notation: $6(4-2y)<12$.

A. $(-\infty,-1)$ B. $(-1,\infty)$ C. $(1,\infty)$ D. $(-\infty,1)$

23. Divide and simplify: $\frac{z^2-3z-28}{z^2-14z+49}\div\frac{8+2z}{z-9}$.

A. $\frac{-z-9}{2(z+7)}$ B. $\frac{(z-9)}{2(z-7)}$ C. $\frac{-(z-9)}{2(z+7)}$ D. $\frac{z+9}{2(z-7)}$

24. Factor completely: $3p-3q-px+qx$.

A. $3(p-q)-x(p+q)$ C. $(p-q)(3-x)$

B. $3(p-q)-x(p-q)$ D. $(p-q)(3+x)$

25. Which of the following is a solution of the equation $-3x-5y=2$?

A. $(\frac{2}{3},1)$ B. $(1,-\frac{3}{5})$ C. $(\frac{1}{2},\frac{1}{6})$ D. $(-\frac{1}{2},-\frac{1}{10})$

26. Solve for *w*: $P=2l+2w$.

A. $w=P-l$ B. $w=\frac{P+2}{2}$ C. $w=P+l$ D. $w=\frac{P-2l}{2}$

27. A ladder rests against a wall. The foot of the ladder is 8 feet from the wall. The top of the ladder is 21 feet from the ground. What is the slope of the ladder?

A. $\frac{21}{8}$ B. $\frac{8}{21}$ C. 21 D. 8

28. Find the slope of the line through the points $(2,0)$ and $(0,6)$.

A. $-\frac{1}{3}$ B. $\frac{1}{3}$ C. 3 D. – 3

29. Solve for *x*: $M = bx - 7x$.

A. $x = \frac{M}{b+7}$ B. x = M – b + 7 C. $x = \frac{M}{b-7}$ D. x = M (b – 7)

30. The perimeter of a rectangle is 80 inches. The length is three times the width. Find the length of the rectangle.

A. 10 in. B. 15 in. C. 20 in. D. 30 in.

31. Is $x = -6$ a solution of the equation $-3x - 2 = -16$?

A. It is a solution of the equation. B. It is not a solution of the equation.

32. Multiply and simplify: $(x-11)(2x-12)$.

A. $2x^2 - 34x + 132$ C. $2x^2 + 132x - 34$

B. $2x^2 - 36x + 132$ D. $2x^2 - 34x - 34$

33. Solve for *s*: $-5 = \frac{1}{6}s$.

A. {–1} B. {0} C. {–30} D. {1}

34. What is the *x*-intercept of $2x + 6y = 30$?

A. $(15,0)$ B. $(5,0)$ C. $(-15,0)$ D. $(-5,0)$

35. Identify the degree of the polynomial: $-18x^2 + 4x$.

A. –18 B. 4 C. 2 D. 1

36. Factor completely: $k^2 - 10k + 100$.

A. $(k+10)(k-10)$ C. $(k+10)^2$

B. $(k-10)^2$ D. This is a prime polynomial.

37. Add and simplify: $\dfrac{d^2-8}{d^2+3d-10}+\dfrac{3d-2}{d^2+3d-10}$.

A. 1 B. $\dfrac{(d-5)(d+2)}{(d+5)(d-2)}$ C. $\dfrac{d+5}{d-2}$ D. $\dfrac{d-2}{d^2+3d-10}$

38. Subtract: $(6x^5-2x^4+8x^2-6x+10)-(16x^5+x^3-5x^2-3x+1)$.

A. $-10x^5-2x^4-x^3+13x^2-3x+9$ C. $10x^5-2x^4-x^3-2x+10$

B. $-10x^5-2x^4+x^3+12x^2+3x-9$ D. $-10x^5-2x^4+x^3+3x^2-9x+11$

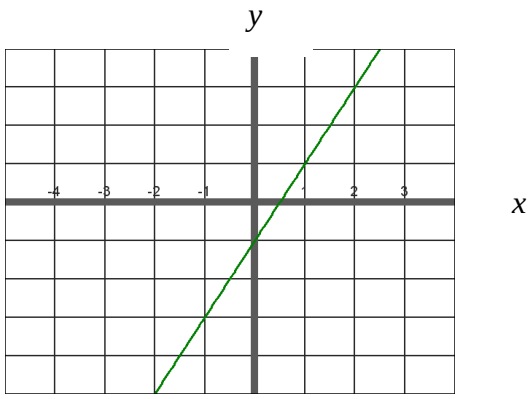
39. Which of the following points below is <u>not</u> a solution of $y=-3x$?

A. $(-1,3)$ B. $(2,-6)$ C. $(-1,-3)$ D. $(-2,6)$

40. Which of the following expressions represents "Four less than three times a number"?

A. $3x-4$ B. $4-3x$ C. $4x-3$ D. $3-4x$

41. What is the equation of the line shown in the graph below? You may assume that each tick mark represents one unit.



A. $y=2x+1$ B. $y=2x-1$ C. $y=-2x+1$ D. $y=-2x-1$

42. Multiply and simplify: $\frac{x^2-7x+12}{x^2+x-12}\bullet\frac{x^2-9}{x^2-x-12}$.

A. $\frac{x-3}{x-5}$ B. $\frac{x-3}{x+4}$ C. $\frac{x-4}{x+3}$ D. $\frac{x+3}{x-4}$

43. Solve the inequality and give the answer in interval notation: $13x-5\geq 12x-4$.

A. $(-\infty,13)$ B. $(-\infty,1]$ C. $[1,\infty)$ D. $(13,\infty)$

44. Subtract and simplify: $\frac{x-8}{x-2}-\frac{2x+4}{x-2}$.

A. $\frac{x-12}{x-2}$ B. $-\frac{x-12}{x-2}$ C. $-\frac{x+12}{x-2}$ D. $\frac{x+12}{x-2}$

45. Which of the following lines has a slope of zero?

A. $x=-4$ B. $y=-4$ C. $-4x=y$ D. $x=-4y$

46. Solve for *t* and write the answer in interval notation: $-7t>21$.

A. $(3,\infty)$ B. $(-\infty,3)$ C. $(-\infty,-3)$ D. $(-3,\infty)$

47. Which equation represents the statement: a number increased by 60 is equal to 410?

A. $x+60x=410$ B. $x+60=410$ C. $x-60=410$ D. $60x=410$

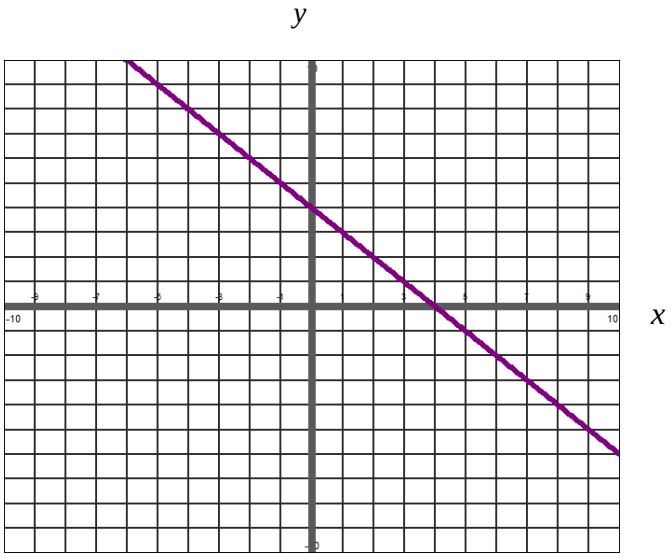
48. Find the length of a rectangle with a perimeter of 134 meters if the length is 7 meters more than the width.

A. 30 m. B. 37 m. C. 67 m. D. 74 m.

49. Find the slope of the line $2x-7y=8$.

A. $\frac{2}{7}$ B. $-\frac{2}{7}$ C. $\frac{7}{2}$ D. $-\frac{7}{2}$

50. What is **true** of the line shown in the graph below? You may assume that each tick mark represents one unit.



A. The graph has a positive slope.
B. The *x*-intercept of the graph is (0, 4).
C. The *y*-intercept of the graph is (0, 4).
D. The graph goes through the origin.

Key

Problem	Ans		Problem	Ans		Problem	Ans		Problem	Ans		Problem	Ans
1	B		12	C		23	B		34	A		45	B
2	D		13	C		24	C		35	C		46	C
3	D		14	C		25	D		36	D		47	B
4	A		15	B		26	D		37	A		48	B
5	B		16	B		27	A		38	A		49	A
6	C		17	C		28	D		39	C		50	C
7	C		18	A		29	C		40	A			
8	B		19	C		30	D		41	B			
9	D		20	B		31	B		42	B			
10	A		21	D		32	A		43	C			
11	A		22	C		33	C		44	C			

Other references:

Solving for a Variable: Although you can't print most of these out without signing up at the site, there are some useful presentations to help with this topic.

http://www.slideshare.net/crainsberg/solving-literal-equations

http://www.scribd.com/doc/6932127/Algebra-1-Notes-YORKCOUNTY-FINAL-Unit-3-Lesson8-Solving-Literal-Equations

Setting up word equations: http://www.slideshare.net/ejboggs/translating-algebra

Graphing: http://www.khanacademy.org/math/algebra/#linear-equations-and-inequalitie

Finding LCD (whole numbers)http://www.youtube.com/watch?v=YbuFd_jio28

Adding Rational Expressions http://www.youtube.com/watch?v=omv7Di2o8-Y

Polynomials and Factoring: http://www.khanacademy.org/math/algebra/#polynomials

Solving Equations: http://www.algebra-class.com/solving-equations.html

Graphing: http://www.algebra-class.com/graphing-equations.html

Exponents: http://www.algebra-class.com/exponents.html

Practice Questions: http://www.algebra-class.com/algebra-practice-test.html

Writing Equations: http://www.algebra-class.com/linear-equations.html

General Algebra Topics: http://www.wtamu.edu/academic/anns/mps/math/mathlab/beg_algebra/

Polynomials http://www.coolmath.com/algebra/03-polynomials/index.html

Exponents: http://www.coolmath.com/algebra/01-exponents/index.html

Factoring: http://www.coolmath.com/algebra/04-factoring/index.html