MATH 025 EXAM 2 REVIEW

The following are review exercises for the Math 025 exam 2. These exercises are provided for you to practice or test yourself for readiness for this exam. There are many more problems appearing here than would be on the exam. These exercises represent many of the types of problems you would be expected to solve on the exam but are not meant to represent all possible types of problems that could appear on the exam. Note for exam 2 you must show all your work in order to receive full credit. Scientific calculators are permitted: graphing calculators or calculators with QWERTY keyboards are NOT permitted. Word problems must be done using algebraic methods to receive full credit.

1. Determine if the given ordered pair is a solution to the given equation:
   a) $(-2,6)\ for\ 2x - 3y = 12$
   b) $(-3,2)\ for\ 4x + 6y = 12$
   c) $(2,-5)\ for\ 5x - 2y = 10$
   d) $(2,5)\ for\ 5x - 2y = 0$

2. Find the missing coordinates for each equation:
   a) $y = 2x - 3\ for\ (-2,\ \ )$

   b) $2y = 3x - 1\ for\ (\ \ ,-3\ )$

   c) $3y - 2x = 12\ for\ (-4,\ \ )$

   d) $2x - 5y = 8\ \ for\ (\ \ ,-6\ \ )$

3. Find the intercepts of each of the following and use the intercepts to sketch the graph of the following:

   a) $3x - 5y = 15$

   b) $2x + 5y = 20$

   c) $7x + 5y = 28$

   d) $5y = 2x - 12$

4. The linear equation $A = -0.02n + 16$ estimates the amount *A* of furniture polish (in ounces) that is left in the bottle after the sprayer trigger has been pulled a total of *n* times. Graph the equation and use the graph to estimate the amount of polish left after 650 sprays.

5. Sketch the graph of the following:

   a) $y = 3$

   b) $x = -5$

c) $2x = 5$

d) $4y = -2$

6. Determine if the ordered pair is a solution of the given system of equations:

a) $(-2,-1)$ $\begin{cases} 3x + 5y = -11 \\ 4x + 7y = -1 \end{cases}$

b) $(-2,1)$ $\begin{cases} 3x - 5y = -11 \\ 4x + 7y = -1 \end{cases}$

c) $(-2,1)$ $\begin{cases} 9x - 6y = -24 \\ 6x - 4y = -16 \end{cases}$

d) $(1,-3)$ $\begin{cases} 2x + 5y = -13 \\ x + 4y = -11 \end{cases}$

7. Solve the following. If the system has no solutions or infinitely many solutions, state so.

a) $\begin{cases} x + 3y = 9 \\ 2x - 4y = -22 \end{cases}$

b) $\begin{cases} x = \frac{2}{3}y \\ 9x + 4y = 5 \end{cases}$

c) $\begin{cases} 3a + 4b = 7 \\ 6a - 2b = 34 \end{cases}$

d) $\begin{cases} \frac{x}{4} + \frac{y}{3} = -\frac{1}{12} \\ \frac{x}{2} - \frac{5}{4}y = \frac{7}{4} \end{cases}$

8. The salaries of the president and the vice-president of the United States total $627,300 a year. If the president makes $172,700 more than the vice-president, find each of their salaries.

9. At a store, ice cream cones cost $1.80 and sundaes cost $3.30. One day the receipts for a total of 148 cones and sundaes were $360.90. How many cones and sundaes were sold?

10. A college used a $5,000 gift from an alumnus to make two students loans. The first was at 5% simple annual interest to a nursing student. The second was at 7% annual simple interest to a business major. If the college collected $310 in interest the first year, how much was loaned to each student?

11. Perform the operations and express the following in simplest form with positive exponents only:

a) $(4xy)(2x^3y)^2$

b) $(3x)^2(2xy)^3$

c) $\frac{(x^3y^4)^3}{x^3y^6}$

d) $(-10r^3s^2)^2$

e) $\frac{(a+32)^{20}}{a+32}$

12. Perform the operations and express the following in simplest form with positive exponents only:

a) $(4xy^{-2})(2x^{-3}y)^{-4}$

b) $(3x)^{-5}(2xy)^{-4}$

c) $\frac{(x^0y^{-2})^{-3}}{x^{-3}y^{-6}}$

d) $(-8r^{-6}s^2)^{-5}$

e) $\left(\frac{xy^3}{x^{-1}y^{-1}}\right)^3$

13. Write each number in scientific notation:

a) 2450.08

b) .000000541

c) 26668.45

d) .00003

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14. Write each number in standard form:

    a) 4.305×10^4

    b) 6307.442×10^6

    c) $.00362 \times 10^5$

    d) 806.31×10^{-2}

    e) 0.351×10^{-4}

    f) 8669.332×10^{-2}

15. Find the degree of each polynomial:

    a) $3x^5 - 24x^8 + 52x^2 - 4$

    b) $5x^2 - 6x^3 + 52x - 4$

    c) $35x^2y^3 - 6x^3y^4 + 52x - 4$

16. Evaluate the polynomial for $x = 3$

    a) $3x^2 - 12x^3 + 2x - 4$

    b) $2x^3 - 4x^2 + 2x - 4$

    c) $3x^2 - 8x^3 + 2x - 14$

17. Perform the operations and simplify:

    a) $(3x^2 - 8x^3 + 2x) + (14x - 5x^2 + 7x^3)$

    b) $(-2x + 4x^4 + 2x^3 - 14) - (-5x^4 + 7x^3 + 6x + 12)$

    c) Subtract the sum of $(2x - 4x^3 + 7x^2 - 8)\ and\ (5x^2 + 6x^3 - 2x - 12)\ from\ (6x^2 - 3x + 7)$.

18. Perform the operations and simplify:

a) $-2x(-2x + 2x^3 - 14)$

b) $-5x(x + 2x^2 - 11) + 3(-5x^4 + 7x^2 + 12x)$

c) $(3 - 2x)(5 + 4x)$

d) $(2a - 4)(2a + 4)$

e) $(2a - 4)(2a - 4)$

f) $3x(x - 5) - 4(x - 5)$

g) $(5x - 4)(2x + 3)$

h) $3x(x - 2)(x + 4)$

i) $(2x + 3)(5x^2 + 2x - 4)$

j) $(x^2 - 5x + 1)(x^2 - 4x - 3)$

19. Use special products to perform the operations and simplify

a) $(3x - 5)(3x + 5)$

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

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

d) $(1 - 5a)^2$

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

f) $(2 - 6x)^2$

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

h) $(3x + 1)^3$

20. Divide the polynomial by the monomial $\frac{4x^{12} - 32x^{16}}{12x^{10}}$

21. Perform each division:

a) Divide $x^2 + 8x + 12$ by $x + 2$

b) Divide $x^2 - 5x + 6$ by $x - 3$

c) Divide $2x^2 + 5x + 2$ by $2x + 3$

22. Factor the following completely:

a) $x^4 + x^3 + 4x^2$

b) $14x^2 - 7x - 7$

c) $32x^2y^3 - 9x^4y^3$

d) $2x + 2y + ax + ay$

e) $7a^3 - 2a^2 + 14a - 4$

f) $rs + 4s^2 - r - 4s$

g) $x^2 - 9x + 18$

h) $a^2 - 4ab - 12b^2$

i) $15a^3 + 75$

j) $x^4 + 11x^3 - 26x^2$

k) $33g^4 - 99$

l) $14a^5 - 42a^4 + 28a^3$

m) $15x^2 - 2xy - y^2$

n) $18x^2 + 31x - 10$

o) $14a^5 - 42a^4 - 28a^3$

p) $10u^2 - 13u - 6$

q) $100a^2 + 81$

r) $100a^2 - 81$

s) $24x^3y - 16x^2y$

t) $4a^2 - 20a + 25$

u) $x^4 - 2x^3 - 8x + 16$

v) $5(x-2) + 10y(x-2)$

23. Solve each equation:

a) $(x+2)(x-3) = 0$

b) $5x(3x+2) = 0$

c) $(x+1)(x-2)(x+3) = 0$

d) $x^2 + 2x - 15 = 0$

e) $a^2 - 17a + 60 = 0$

f) $(x+2)(x-3) = 0$

g) $x^2 - 49 = 0$

h) $x^2 = 6x$

i) $a^2 = 16a$

j) $2x^2 + x = 3$

k) $5x^2 + 1 = 6x$

l) $4a(a+7) = -49$

m) $9x(x-3) = 3x - 25$

n) $2x^3 = 2x(x+2)$

ANSWERS:

1 $a)\ no\ \ b)\ no\ \ c)\ no\ \ d)\ yes$ 2 $a) y = -7\ \ b) x = -5/3\ \ c)\ y = 4/3\ \ d)\ x = -11$
3 $a)\ x - int = 5, y\ int = -3\ \ b)\ x - int = 10, y - int = 4\ \ c)\ x - int = 4,$
$y - int = 28/5\ \ d)\ x - int = 6, y - int = -12/5$ 4 $3oz.$

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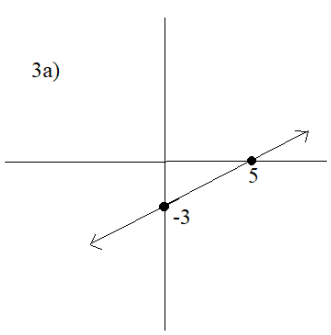

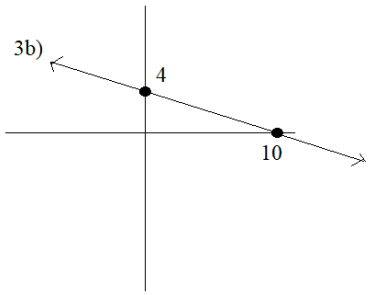

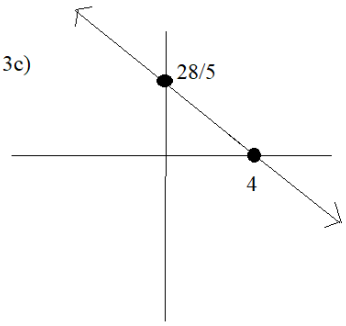

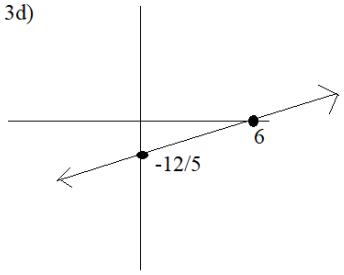

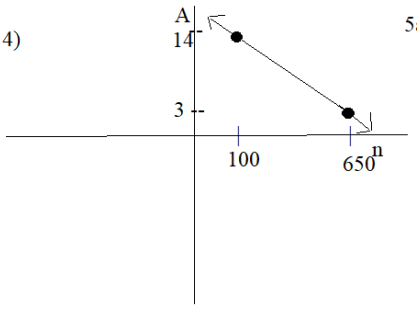

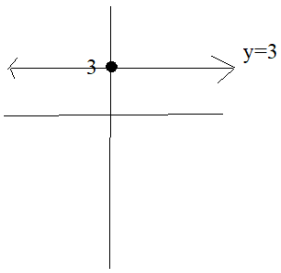

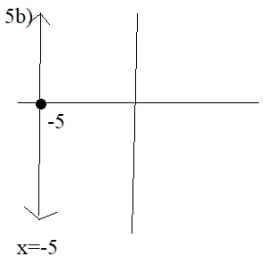

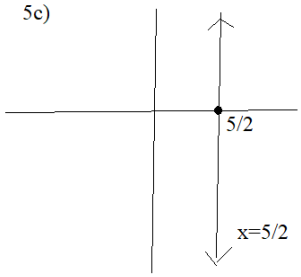

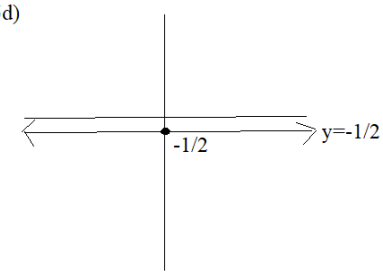

6. $a)$ *no* $b)$ *yes* $c)$ *yes* $d)$ *yes* 7 $a)\ (-3,4)$ $b)(1/3,1/2)$ $c)\ (5,-2)$ $d)\ (1,-1)$
8. $P = \$400{,}000, VP = \$227{,}300$ 9. 85 *cones*, 63 *sundaes*
10. *Nursing student* \$2,000. *business major* \$3,000

11 $a)\ 16x^7y^3$ $b)\ 72x^5y^3$ $c)\ x^6y^6$ $d)\ 100r^6s^4$ $e)\ (a+32)^{19}$

12 $a)\ \frac{x^{13}}{4y^6}$ b) $\frac{1}{3888x^9y^4}$ $c)\ x^3y^{12}$ d) $-\frac{r^{30}}{32768s^{10}}$ e) x^6y^{12}

13 $a)\ 2.45008 \times 10^3$ $b)\ 5.41 \times 10^{-7}$ $c)\ 2.666845 \times 10^4$ $d)\ 3.0 \times 10^{-5}$

14 $a)$ 43,050 $b)$ 6,307,442,000 $c)$ 362 $d)$ 8.0631 $e)$ .0000351 $f)$ 86.69332

15 a) 8 b) 3 $c)$ 7 16 $a) -295$ $b)\ 20$ $c) -197$
17 $a) -x^3 - 2x^2 + 16x$ $b)\ 9x^4 - 5x^3 - 8x - 26$ $c)\ -2x^3 - 6x^2 - 3x + 27$
18 $a) -4x^4 + 4x^2 + 28x$ $b)\ -15x^4 - 10x^3 + 16x^2 + 91x$ $c)\ 15 + 2x - 8x^2$
$d)\ 4a^2 - 16$ $e)\ 4a^2 - 16a + 16$ $f)\ 3x^2 - 19x + 20$ $g)\ 10x^2 + 7x - 12$
$h)\ 3x^3 + 6x^2 - 24x$ $i)\ 10x^3 + 19x^2 - 2x - 12$ $j)\ x^4 - 9x^3 + 18x^2 + 11x - 3$

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19 $a)\ 9x^2 - 25$ $b)\ 9x^2 - 30x + 25$ $c)\ 9x^2 + 30x + 25$ $d)\ 1 - 10a + 25a^2$
$e)\ 9 + 30x + 25x^2$ $f)\ 4 - 24x + 36x^2$ $g)\ 18x^3 - 60x^2 + 50x$
$h)\ 27x^3 + 27x^2 + 9x + 1$

20 $\dfrac{x^2 - 8x^6}{3}$ 21 $a)\ x + 6$ $b)\ x - 2$ $c)\ x + 1\ R{:}\ -1$

22 $a)\ x^2(x^2 + x + 4)$ $b)\ 7(2x + 1)(x - 1)$ $c)\ x^2y^3(32 - 9x^2)$ $d)\ (2 + a)(x + y)$
$e)\ (a^2 + 2)(7a - 2)$ $f)\ (r + 4s)(s - 1)$ $g)\ (x - 6)(x - 3)$ $h)(a + 2b)(a - 6b)$
$i)\ 15(a^3 + 5)$ $j)\ x^2(x + 13)(x - 2)$ $k)\ 33(g^4 - 3)$ $l)\ 14a^3(a - 2)(a - 1)$
$m)\ (5x + y)(3x - y)$ $n)\ (18x - 5)(x + 2)$ $o)\ 14a^3(a^2 - 3a - 2)$ $p)\ Does\ not\ factor$
$q)\ Does\ not\ factor$ $r)\ (10a + 9)(10a - 9)$ $s)\ 8x^2y(3x - 2)$ $t)\ (2a - 5)^2$
$u)\ (x^3 - 8)(x - 2)$ $v)\ 5(x - 2)(1 + 2y)$

23 $a)\ x = -2, 3$ $b)\ x = 0, -2/3$ $c)\ x = -1, 2, -3$ $d)\ x = -5, 3$ $e)\ a = 5, 12$
$f)\ x = -2, 3$ $g)\ x = -7, 7$ $h)\ x = 0, 6$ $i)\ a = 0, 16$ $j)\ x = -3/2, 1$ $k)\ x = 1/5, 1$
$l)\ a = -\dfrac{7}{2}$ $m)\ x = 5/3$ $n)\ x = 0, -1, 2$