MAP4C Mid-Term Exam Review

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1 Algebra

1. Expand and simplify.

a) (p-4)(p+5)
$=$p$^2 + 5p - 4p - 20$
$= p^2 + p - 20$

b) $(n + 8)(n + 2)$
$= n^2 + 2n + 8n + 16$
$= n^2 + 10n + 16$

c) $(m + 3)(m = 7)$
$= m^2 - 7m + 3m = 21$
$= m^2 - 4m - 21$

d) $(w - 4)(w - 6)$
$= w^2 - 6w - 4w + 24$
$= w^2 - 10w + 24$

e) $(2x - 3)(5x - 4)$
$= 10x^2 - 8x - 15x + 12$
$= 10x^2 - 23x + 12$

f) $(y - 5)(2y + 9)$
$= 2y^2 + 9y - 10y - 45$
$= 2y^2 = y = 45$

g) $(3a + 1)(4a + 1)$
$= 12a^2 + 3a + 4a + 1$
$= 12a^2 + 7a + 1$

h) $(7 - x)(4 + x)$
$= 28 + 7x - 4x - x^2$
$= 28 + 3x - x^2$

i) $(x - 6)(x + 6)$
$= x^2 + 6x - 6x - 36$
$= x^2 - 36$

j) $(x + 2)^2$
$= (x + 2)(x + 2)$
$= x^2 + 2x + 2x + 4$
$= x^2 + 4x + 4$

k) $(y + 11)(y - 11)$
$= y^2 - 11y = 11y - 121$
$= y^2 - 121$

l) $(z - 5)^2$
$= (z - 5)(z - 5)$
$= z^2 - 5z - 5z + 25$
$= z^2 - 10z + 25$

2. *Expand and simplify.*
a) $4(x - 2)(3x - 5)$
$= (4x - 8)(3x - 5)$
$= 12x^2 - 20x - 24x + 40$
$= 12x^2 - 44x + 40$

b) $(4x - 3)^2 - 5(3n^2 - 5x + 7)$
$= (4x - 3)(4x - 3) - (15x^2 - 25x + 35)$
$= (16x^2 - 12x - 12x + 9) - (15x^2 - 25x + 35)$
$= 16x^2 - 24x + 9 - 15x^2 - 25x + 35$
$= x^2 + x - 26$

3. *Find an expression for the area of each shape.*
a)
$(2x - 5)(x + 1)$
$= 2x^2 + 2x - 5x - 5$
$= 2x^2 - 3x - 5$

b)
$(5x)(8x + 3) - (3x + 1)(4x + 4)$
$= 40x^2 + 3 - 12x^2 + 12x + 4x + 4$
$= 28x^2 + 16x7$

4. *Factor each of the following completely.*
a) $18 - 12x$
$= 6(3 - 2x)$

b) $21w^2 - 28x + 35$

$= 7(3w^2 - 4w + 5)$

c) $24x^2 + 16x$
$= 8(3x^2 + 2x)$

d) $15x^3 - 20a^2 + 24a$
$= 5a(3a^2 - 4a + 5$

e) $20m^2 - 30m$
$= 10m(2m - 3)$

f) $27k^3 - 36k^5$
$= 9k^3(3 - 4k^2)$

g) $n^2 - 144$
$= (n - 12)(n - 12)$

h) $(81 - x^2$
$= (9 + x)(9 - x)$

i) $5m^2 - 80$
$5(m^2 - 16)$

j) $10x^2 - 90$
$= 10(x^2 - 9)$

k) $x^2 + 5x + 6$
$(x + 2)(x + 3)$

l) $a^2 - a - 30$
$= (a - 6)(a + 5)$

m) $x^2 + 3x - 10$
$= (x + 5)(x - 2)$

n) $m^2 - 9m + 20$
$= (m - 5)(m - 4)$

o) $x^2 + 6x - 27$
$= (x - 3)(x + 9)$

p) $3x^2 - 6x - 105$
$= 3(^2 - 2x - 35$
$= 3(x - 7)(x + 5)$

q) $5x^2 + 17x + 6$

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

$r)\ 5x^2 - 7x - 6$
$= (x - 2)(5x + 3)$

$s)\ 3n^2 + 10x + 3$
$= 3x + 1)(x + 3)$

$t)\ 2x^2 + 9x + 4)$

5. *Solve each quadratic equation.*
$a)\ x^2 - 7x + 10 = 0$
$= (x - 5)(x - 2)$

$b)\ x^2 - x - 12 = 0$
$= (x - 4)(x + 3)$

$c)\ x^2 - 25 = 0$
$= (x + 5)(x + 5)$

$d)\ x^2 - 3x = 10$
$x^2 - 3x - 10 = 0$
$= (x - 5)(x + 2)$

$e)\ x^2 + 10x + 25 = 0$
$= (x + 5)(x + 5)$

$f)\ x^2 + 81 = 81x$
$x^2 + 81 - 18x = 0$
$= (x - 9)(x - 9)$

2 Budgets

1. The Marcella family spends 250 dollars per week on groceries. How much should they budget monthly for their grocery costs?
A. 1000 dollars
B. 1083.33 dollars
C. 541.67 dollars
D. 500 dollars
Answer: 250 dollars per week x 52 weeks per year $\div$ 12 *months in a year*
$= 10833.33\ dollars\ (D.)$

2. *Which is not a tenant's responsibility?*
A. Pay rent on time.

B. Give 60 written notice before moving out
C. Pay property tax
D. Repair any damage he or she causes
Answer: D. Repair any damage he/she causes. Tenants are not liable for damage costs, unless it w

3. Explain the difference between fixed and variable costs in relation to renting or owning your own
Fixes expenses:
−Mortgage
−Rent (if applicable)
−Property taxes (if paying monthly)
−House/tenant insurance
−Utility bills
−Lease/car loan payment
−Life/health insurance
Vehicle insurance
Charity monthly donations

Variable costs:
−Groceries
−Personal items
−Fuel public transportation
−Parking
Clothing
Eating out
Entertainment
Alcohol/ tobacco/ gambling
−Miscellaneous

4. Raj is moving to London to attend college. He finds two housing options near campus.
Option 1: Room in a home shared with three other students. Rent is 350 dollars plus one quarter of
Option 2: One bedroom basement apartment in a house. Rent is 470 dollars including all utilities. M

a) What would be the annual rent for each option?
Option 1: 350 dollars a month, plus one quarter of all utilities (undetermined)
Option 2: 470 dollars a month, including utilities
c) I would recommend option 1. One quarter of the cost of utilities can't be more than 120 dollars, m