MPM2D1

Name: Uni Lee
Date: Nov 15, 2012

TEST – Factoring & Transformations #3

K/U /13 A /16 TIP /15 C /Level

Knowledge and Understanding.

1. Evaluate: 2^{-3}

   a) -8 b) -6 c) $-\frac{1}{8}$ d) $\frac{1}{4}$ e) $\frac{1}{8}$

2. Evaluate: $\left(\frac{2}{3}\right)^{-3}$

   a) $-\frac{8}{3}$ b) $-\frac{8}{27}$ c) $\frac{8}{27}$ d) $\frac{27}{8}$ e) $\frac{35}{6}$

3. Expand and simplify: $(2x+5y)(3x-2y)$

   a) $6x^2-11xy-10y^2$ b) $6x^2+3xy-10y^2$ c) $6x^2+4xy-10y^2$
   d) $6x^2-10y^2$ e) $6x^2+11xy-10y^2$

4. Expand and simplify: $(3x+4)^2$

   a) $12x^2+12x+16$ b) $12x^2+24x+16$ c) $9x^2+24x+16$ d) $9x^2+12x+16$ e) $9x^2+24x+8$

5. Expand and simplify: $(4x-3y)^2$

   a) $12x^2-12xy+9y^2$ b) $8x^2-24xy+9y^2$ c) $16x^2-24xy+9y^2$
   d) $16x^2-24xy-9y^2$ e) $16x^2-12xy+9y^2$

6. Factor: $x^2+7x+12$

   a) $(x+4)(x+3)$ b) $(x+2)(x+6)$ c) $(x+12)(x+1)$ d) $(x+7)(x+5)$ e) $(x-4)(x-3)$

7. Factor: $2x^2+13x-15$

   a) $(2x+15)(x-1)$ b) $(2x-5)(x+3)$ c) $(2x+3)(x-5)$ d) $(2x+5)(x-3)$ e) $(2x-1)(x-15)$

8. Factor: $9x^2-16y^2$

   a) $(3x-4y)(3x-4y)$ b) $(9x+16y)(x-y)$ c) $(9x-16y)(x+y)$
   d) $(3x+4y)(3x-4y)$ e) $x(9x-16y)$

9. Factor completely: $8x^2+48x+72$

   a) $8(x+3)^2$ b) $(8x+24)(x+3)$ c) $(2x+6)(4x+12)$
   d) $8(x^2+6x+9)$ e) $4(2x+3)(x+6)$

10. Factor: $x^4-12x^2y^2+36y^4$

    a) $(x^2-6y^2)^2$ b) $(x^2-12y^2)^2$ c) $(x^4-6y^2)^2$ d) $(x^2-6y^4)^2$ e) $(x^4-6y^4)^2$

19

[3] 11. Complete the following table:

Equation	Vertex	Axis of symmetry	Vertical stretch or compression	Vertical movement	Horizontal movement	Max. or Min. value
$y = -2(x-3)^2 - 1$	(3, -1)	x = 3	vertical stretch by	1 unit down	3 units right	y max = -1
$y = \frac{1}{2}x^2 + 8$	(-8, 0)	x = -8	vertical compression by	8 units left	none	y min = 0

2.5

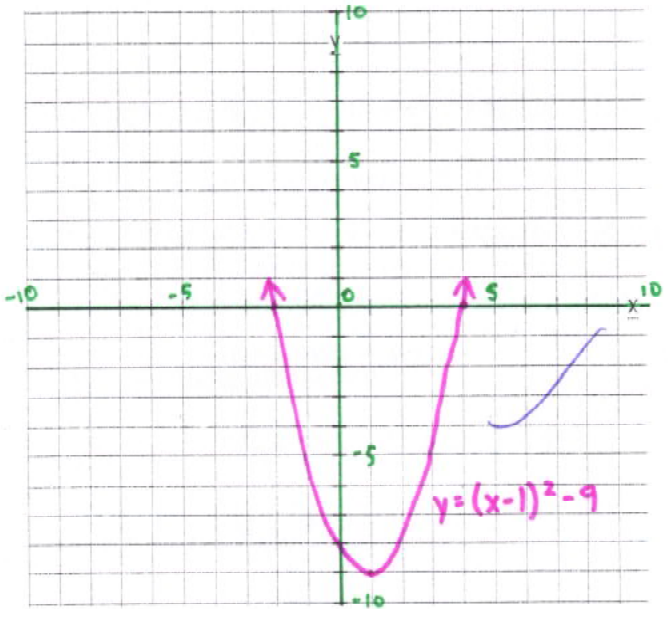
Applications.

[4] 12. The zeros of parabola are -2 and 4. The parabola is congruent to $y = x^2$. Find an equation in a factored form and graph it using zeros.

① $y = (x+2)(x-4)$

$M = \frac{-2+4}{2}$

$= 1$



sub x = 1 into ①

$y = (1+2)(1-4)$

$= 3 \times -3$

$= -9$.

vertex = (1, -9)

4

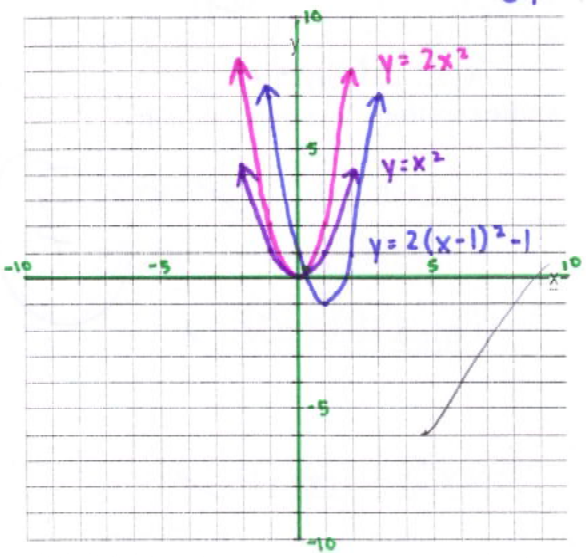
$y = (x-1)^2 - 9$

/4

[12] **13.** Graph using transformations.

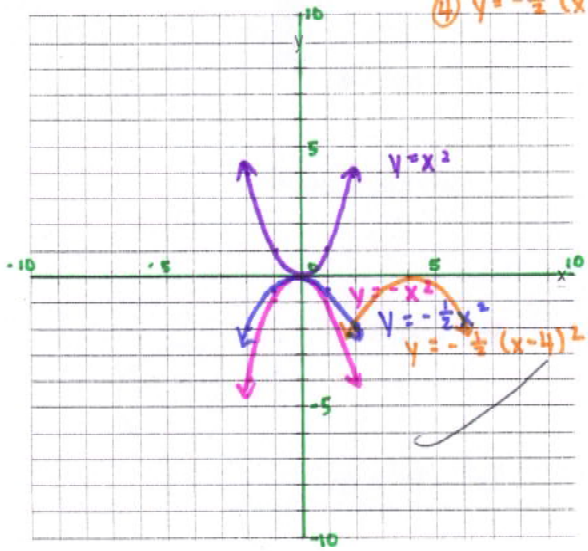
a) $y = 2(x-1)^2 - 1$

① $y = x^2$
② $y = 2x^2$
③ $y = 2(x-1)^2 - 1$



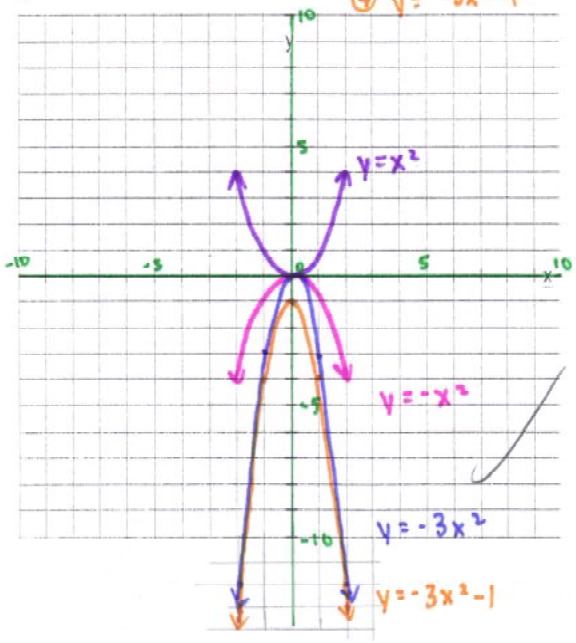
b) $y = -\frac{1}{2}(x-4)^2$

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



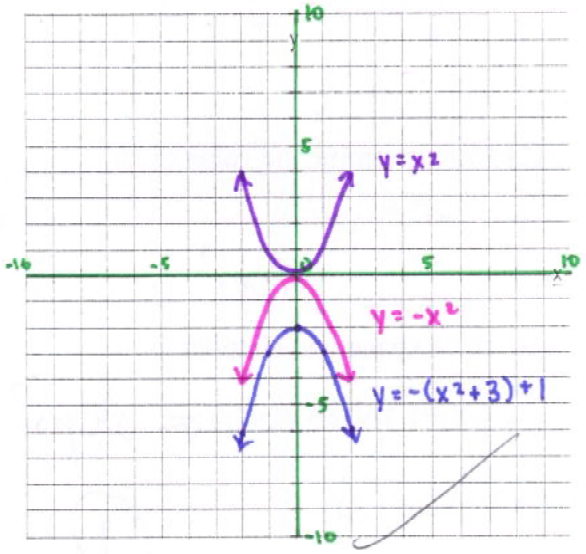
c) $y = -3x^2 - 1$

① $y = x^2$
② $y = -x^2$
③ $y = -3x^2$
④ $y = -3x^2 - 1$



d) $y = -(x^2 + 3) + 1$

① $y = x^2$
② $y = -x^2$
③ $y = -(x^2+3)+1$



12

Thinking. Inquiry. Problem Solving. [15]

[7] 14. Factor fully.

a) $mx - my - 5x + 5y$ $(x-y)(m-5)$ ✓

b) $5m^2 - 6m - 8$ $(m-2)(5m+4)$ ✓

c) $4x^2 - 28xy + 49y^2$ $(2x+7y)^2$ ✓

d)) $3m^2 - 8m - 3$ $(m-3)(3m+1)$ ✓

e) $3x^3 - 3x^2 - 6x$ $3x(x-2)(x+1)$ ✓

f) $4a^2 - (2b+3)^2$ $(2a+2b+3)(2a-2b+3)$ ✓

g) $(x^2-3x)^2 - 2(x^2-3x) - 8$ $(x-4)(x+1)(x-2)(x-1)$ ✓

7

[2] 15. Determine the value of "n"

$-3^n = -\frac{1}{27}$ $n = -3$ (5)

steps?

[3] 16. Expand and simplify.

$(3x+4)^2 - 3(x+5)(x-1)$ ← steps?

$= 6x^2 - 12x + 31$

(1)

[3] 17. A parabola has zeros at -1 and 5 and passes through (0, -5). Write an equation in a standard form.

$M = \frac{-1+5}{2}$

$= 2$ ✓

$y = (x+1)(x-5)$

$y = x^2 - 4x - 5$

steps

$a = ?$

(2)

10.5