Thread 1 – Quadratic Expressions – Mini-Test Review Questions

Complete all visible questions.

You can check final answers on the third page.

2. Simplify. KNOWLEDGE

a) $4x^2(3x - 5y + 8z)$

b) $3m(6m^2 - 5m + 4) - (4m^3 - 8m^2 + 9)$

3. Expand and simplify.

a) $(y + 5)(y + 9)$

b) $(4x - 7)(3x + 2)$

c) $(6k + 1)(6k - 1)$ KNOWLEDGE

d) $(w - 8)^2$

e) $(4c + 5d)^2$

f) $2(x - 4)(x - 7) - 5(8x - 9)(8x + 9)$

5. Factor.

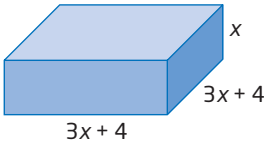
a) $9d^2e^2 + 6d^3e$

b) $15p^2qr^3 - 25p^3q^2r + 5pqr$

c) $5(x + 6) - 2(x + 6)$ KNOWLEDGE

d) $16x^2 + 8x - 6x - 3$

6. a) Find an algebraic expression for the surface area of the square-based prism.



APPLICATION

b) Expand and simplify your expression from part a).

c) Factor the resulting expression from part b).

7. Factor.

a) $x^2 + 11x + 24$

b) $y^2 - 15y + 56$

c) $n^2 - n - 90$ KNOWLEDGE

d) $x^2 - 14x + 49$

e) $h^2 - 100$

f) $d^2 + 16d + 64$

8. Factor. KNOWLEDGE

a) $3k^2 + 12km - 36m^2$

b) $8y^2 + 19y + 6$

c) $9w^2 - 24w + 7$

d) $25a^2 + 60a + 36$

e) $121w^2 - 144$

f) $10x^2 - 7xy - 6y^2$

NOTE: For #9, do NOT list all possible factors... just explain the process you would go through to determine if the expression can be factored.

9. Explain how to determine whether or not you can factor $9x^2 - 10x + 18$ over the integers. COMMUNICATION

10. The area of a rectangle is given as $x^2 + 13x - 30$.

a) Determine polynomials that represent the length and width of the rectangle.

b) What is the smallest integer value of x for which this area expression makes sense? THINKING/INQUIRY

11. Determine all values of k so that each trinomial is a perfect square.

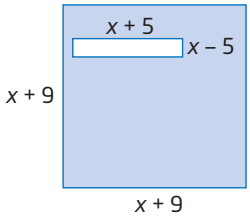
a) $36x^2 + kx + 121$

b) $49d^2 - 56d + k$ THINKING/INQUIRY

c) $25x^2 - 60xy + ky^2$

d) $ka^2 + 30ab + 9b^2$

12. a) Write an algebraic expression for the area of the shaded region.



APPLICATION

b) Write the area expression in factored form. APPLICATION

NOTE: #12b -- Expand, simplify, then factor.

c) Substitute $x = 7$ into both forms. Are the results the same? Why? COMMUNICATION

13. A parabola has equation $y = 2(x + 6)^2 - 2$.

a) Expand and simplify to write the equation in the form $y = ax^2 + bx + c$. KNOWLEDGE

b) Factor your equation from part a). KNOWLEDGE

c) Do the three equations represent the same parabola? Justify your response. COMMUNICATION

Thread 1 – Quadratic Expressions – Mini-Test Review Answers

Final answers for questions are found below and to the right.

2. **a)** $12x^3 - 20x^2y + 32x^2z$
b) $14m^3 - 7m^2 + 12m - 9$

3. **a)** $y^2 + 14y + 45$ **b)** $12x^2 - 13x - 14$
c) $36k^2 - 1$ **d)** $w^2 - 16w + 64$
e) $16c^2 + 40cd + 25d^2$ **f)** $-318x^2 - 22x + 461$

5. **a)** $3d^2e(3e + 2d)$ **b)** $5pqr(3pr^2 - 5p^2q + 1)$
c) $(x + 6)(3)$ **d)** $(2x + 1)(8x - 3)$

6. **a)** Surface area: $2(3x + 4)^2 + 4(x)(3x + 4)$
b) $30x^2 + 64x + 32$
c) $2(3x + 4)(5x + 4)$

7. **a)** $(x + 8)(x + 3)$ **b)** $(y - 8)(y - 7)$
c) $(n - 10)(n + 9)$ **d)** $(x - 7)^2$
e) $(h + 10)(h - 10)$ **f)** $(d + 8)^2$

8. **a)** $3(k + 6m)(k - 2m)$ **b)** $(8y + 3)(y + 2)$
c) $(3w - 7)(3w - 1)$ **d)** $(5a + 6)^2$
e) $(11w + 12)(11w - 12)$ **f)** $(5x - 6y)(2x + y)$

9. If there are two integers whose product is 9×18 and whose sum is -10, then $9x^2 - 10x + 18$ can be factored over the integers.

10. **a)** length $x + 15$, width $x - 2$
b) 3

11. **a)** 132, -132 **b)** 16
c) 36 **d)** 25

12. **a)** Area: $(x + 9)^2 - (x + 5)(x - 5)$
b) $2(9x + 53)$
c) 232 square units; the results are the same because the expressions are equivalent.

13. **a)** $y = 2x^2 + 24x + 70$ **b)** $y = 2(x + 7)(x + 5)$
c) Yes, because the three expressions give the same graph when graphed using a graphing calculator.