* Quadratics *

Regents Exam Questions
CC.A.SSE.2: Factoring Polynomials
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CC.A.SSE.2 Factoring Polynomials: Use the structure of an expression to identify ways to rewrite it. For example, see x4–y4 as (x2)2–(y2)2, thus recognizing it as a difference of

1 Four expressions are shown below.

I $2(2x^2 - 2x - 60)$
II $4(x^2 - x - 30)$
III $4(x + 6)(x - 5)$
IV $4x(x - 1) - 120$

The expression $4x^2 - 4x - 120$ is equivalent to
1) I and II, only
2) II and IV, only
3) I, II, and IV
4) II, III, and IV

2 When factored completely, $x^3 - 13x^2 - 30x$ is
1) $x(x + 3)(x - 10)$
2) $x(x - 3)(x - 10)$
3) $x(x + 2)(x - 15)$
4) $x(x - 2)(x + 15)$

3 Which expression is equivalent to $x^4 - 12x^2 + 36$?
1) $(x^2 - 6)(x^2 - 6)$
2) $(x^2 + 6)(x^2 + 6)$
3) $(6 - x^2)(6 + x^2)$
4) $(x^2 + 6)(x^2 - 6)$

4 Factor: $16a^4 + 8a^2b^2 + b^4$

5 Factor: $9x^4 - 12x^3 + 4x^2$

6 Factor: $x^4 + \frac{x^2}{2} + \frac{1}{16}$

7 Factor the expression $x^4 + 6x^2 - 7$ completely.

Regents Exam Questions
CC.A.SSE.3: Vertex Form of a Quadratic
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CC.A.SSE.3: Vertex Form of a Quadratic: Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.

1 In the function $f(x) = (x-2)^2 + 4$, the minimum value occurs when x is
1) -2
2) 2
3) -4
4) 4

2 If Lylah completes the square for $f(x) = x^2 - 12x + 7$ in order to find the minimum, she must write $f(x)$ in the general form $f(x) = (x-a)^2 + b$. What is the value of a for $f(x)$?
1) 6
2) -6
3) 12
4) -12

Regents Exam Questions
CC.A.SSE.3: Solving Quadratics
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CC.A.SSE.3: Solving Quadratics: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

1 Keith determines the zeros of the function $f(x)$ to be -6 and 5. What could be Keith's function?
1) $f(x) = (x+5)(x+6)$
2) $f(x) = (x+5)(x-6)$
3) $f(x) = (x-5)(x+6)$
4) $f(x) = (x-5)(x-6)$

2 Which equation has the same solutions as $2x^2 + x - 3 = 0$
1) $(2x-1)(x+3) = 0$
2) $(2x+1)(x-3) = 0$
3) $(2x-3)(x+1) = 0$
4) $(2x+3)(x-1) = 0$

3 The zeros of the function $f(x) = 2x^2 - 4x - 6$ are
1) 3 and -1
2) 3 and 1
3) -3 and 1
4) -3 and -1

4 The zeros of the function $f(x) = 3x^2 - 3x - 6$ are
1) -1 and -2
2) 1 and -2
3) 1 and 2
4) -1 and 2

5 Solve $8m^2 + 20m = 12$ for m by factoring.

6 In the equation $x^2 + 10x + 24 = (x+a)(x+b)$, b is an integer. Find algebraically *all* possible values of b.

Algebra I Practice CC.A.SSE.3: Vertex Form of a Quadratic
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CCSS.A.SSE.3: Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. b. Complete the square in a quadratic expression to reveal the maximum and minimum value of the function it defines.

1. Write in standard form (for a parabola):
   $y = x^2 + 12x - 2$

   [A] $y = (x+6)^2 + 142$

   [B] $y = (x+6)^2 - 34$

   [C] $y = (x+6)^2 - 38$

   [D] $y = (x+6)^2 + 34$

2. Write in standard form (for a parabola):
   $y = x^2 - 8x + 1$

   [A] $y = (x-4)^2 - 15$

   [B] $y = (x-4)^2 + 17$

   [C] $y = (x-4)^2 - 17$

   [D] $y = (x-4)^2 + 65$

3. Write in standard form (for a parabola):
   $y = x^2 + 14x - 4$

   [A] $y = (x+7)^2 + 192$

   [B] $y = (x+7)^2 - 45$

   [C] $y = (x+7)^2 - 53$

   [D] $y = (x+7)^2 + 45$

4. Write in standard form (for a parabola):
   $y = x^2 + 10x + 6$

   [A] $y = (x+5)^2 + 106$

   [B] $y = (x+5)^2 + 31$

   [C] $y = (x+5)^2 - 31$

   [D] $y = (x+5)^2 - 19$

5. Write in standard form (for a parabola):
   $y = x^2 + 14x + 2$

   [A] $y = (x+7)^2 - 47$

   [B] $y = (x+7)^2 - 51$

   [C] $y = (x+7)^2 + 198$

   [D] $y = (x+7)^2 + 51$

6. Write in standard form (for a parabola):
   $y = x^2 + 8x + 4$

   [A] $y = (x+4)^2 + 68$

   [B] $y = (x+4)^2 - 20$

   [C] $y = (x+4)^2 + 20$

   [D] $y = (x+4)^2 - 12$

7. Which is the vertex form of this equation?
   $y = -x^2 + 5x - 1$

   [A] $y = \left(x - \frac{5}{2}\right)^2 + \frac{21}{4}$

   [B] $y = -\left(x - \frac{5}{2}\right)^2 - \frac{29}{4}$

   [C] $y = -\left(x - \frac{5}{2}\right)^2 + \frac{21}{4}$

   [D] $y = -\left(x + \frac{5}{2}\right)^2 - \frac{29}{4}$

8. The daily profit of a custom T-shirt shop can be modeled by $P(n) = -n^2 + 60n - 400$, where n is the number of T-shirts produced each day and $P(n)$ is the profit made on that number. Rewrite this function in vertex form and determine the maximum daily profit.