Simplify each expression.

1) $(4x^2 - 7x^4 - 3x) - (7x^2 + 5x^4 - 2x)$

A) $-12x^4 - 3x^2 - x$
B) $-18x^4 - 3x^2 - x$
C) $-18x^4 - 3x^2 - 10x$
D) $-18x^4 - 3x^2 - 2x$

2) $(b - 4b^4 + 1) + (7b - 6 + b^4)$

A) $-4b^4 + 3b - 2$
B) $-3b^4 + 8b - 5$
C) $-3b^4 + 8b - 2$
D) $-3b^4 + 3b - 2$

3) $(5m + 2m^3 + 2) - (7 - 4m^3 - 6m)$

A) $6m^3 + 11m - 5$
B) $8m^3 + 11m - 5$
C) $8m^3 + 11m - 9$
D) $14m^3 + 11m - 9$

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

A) $7x^4 + 3x^3 + 3x^2 + 7$
B) $7x^4 + 7 + 10x^2 - 6x^3$
C) $7x^4 + 7 + 3x^2$
D) $7x^4 + 7 + 10x^2$

Solve each equation with the quadratic formula.

5) $5b^2 - 85 = 8b$

A) $\{-4 + \sqrt{101}, -4 - \sqrt{101}\}$
B) $\{\frac{17}{5}, -5\}$
C) $\{7, -19\}$
D) $\{5, -\frac{17}{5}\}$

6) $6n^2 = -3n + 63$

A) $\{\frac{7}{2}, -3\}$
B) $\{4, -\frac{13}{5}\}$
C) $\{3, -\frac{7}{2}\}$
D) $\{\frac{-3 + 3\sqrt{29}}{2}, \frac{-3 - 3\sqrt{29}}{2}\}$

Factor each.

7) $2x^2 - 7x - 15 = 0$

A) $(2x + 3)(x - 5) = 0$
B) $3(x + 1)(x - 5) = 0$
C) $2(x + 1)(x - 5) = 0$
D) $(2x + 3)(3x - 5) = 0$

8) $x^2 - 11x + 5 = 0$

A) $3x^2 - 11x + 5 = 0$
B) $x^2 - 11x + 7 = 0$
C) $x^2 - 11x + 5 = 0$
D) $x^2 + 12x + 5 = 0$

9) $5x^2 + 6x + 1 = 0$

A) $2(5x + 1)(x + 1) = 0$
B) $(7x + 1)(x + 1) = 0$
C) $(5x + 1)(x + 1) = 0$
D) $(5x + 1)(x + 2) = 0$

10) $2x^2 + 9x + 10 = 0$

A) $(2x + 5)(x + 3) = 0$
B) $2(x + 3)(x + 2) = 0$
C) $(2x + 5)(x + 2) = 0$
D) $(x + 5)(x + 2) = 0$

11) $5x^2 + 23x - 10 = 0$

A) $(5x - 2)(2x + 5) = 0$
B) $(3x - 2)(x + 5) = 0$
C) $(5x - 2)(x + 5) = 0$
D) $2(2x - 1)(x + 5) = 0$

Solve each equation.

12) $|10 - 3b| = 19$

A) $\{-1, 6\}$ B) $\{-3, \frac{29}{3}\}$
C) $\{\frac{17}{3}, -6\}$ D) $\{\frac{17}{3}\}$

13) $|2x + 5| = 9$

A) $\{2, -7\}$ B) $\{-6, \frac{28}{5}\}$
C) $\{-6\}$ D) $\{4, -\frac{21}{4}\}$

Factor each completely.

14) $20x^4 - 24x^3$

A) $20x(x - 6)$
B) $4x^3(5x - 6)$
C) $4x(5x + 6)$
D) $5x^2(7x - 9)(x - 8)$

15) $7x^3 - 65x^2 + 72x$

A) $(7x + 12)(x + 6)$
B) $x(7x + 24)(x + 3)$
C) $x(7x - 9)(x - 8)$
D) $(7x + 36)(x + 2)$

16) $28n^2 - 144n + 20$

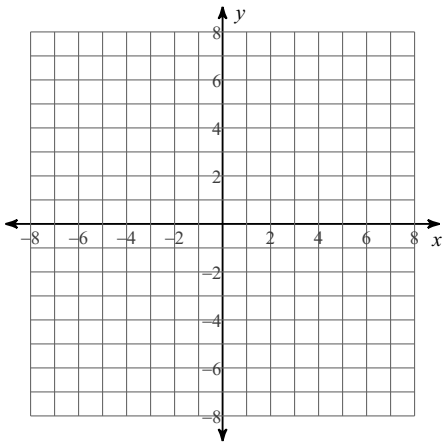
A) $4(7n + 5)(n + 1)$
B) $4(7n - 1)(n - 5)$
C) $(n - 1)(7n - 5)$
D) $4(7n + 1)(n - 5)$

17) $2x^3 + 17x^2 + 35x$

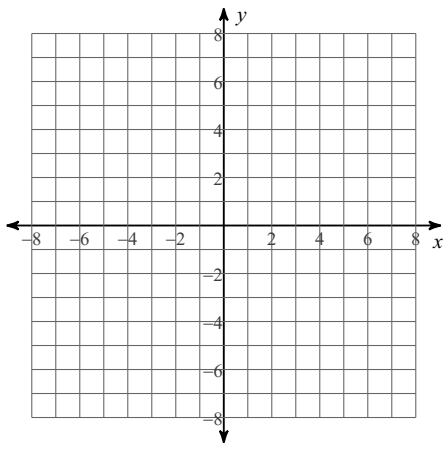
A) $x(2x + 7)(x + 5)$
B) $(2x - 7)(x - 5)$
C) Not factorable
D) $x(2x + 35)(x + 1)$

Identify the vertex and axis of symmetry of each. Then sketch the graph.

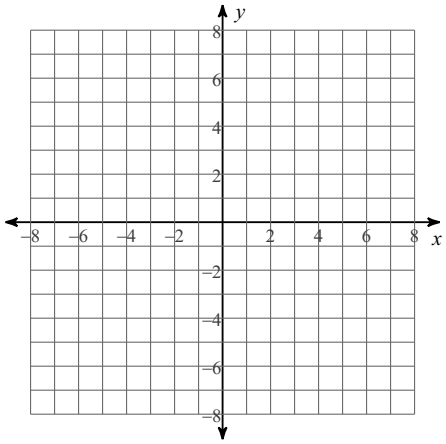
18) $y = -x^2$



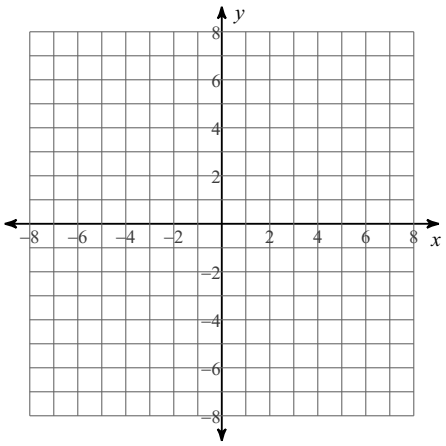
19) $y = \frac{1}{4}x^2 + 3x + 4$



20) $y = 2x^2 + 20x + 50$



21) $y = \frac{1}{3}x^2 + 6$



Name each polynomial by degree and number of terms.

22) $4b^2 + 9b - 8$

A) quadratic trinomial
B) constant trinomial
C) constant binomial
D) linear trinomial

23) $-7r - 1$

A) constant monomial
B) quadratic binomial
C) quadratic monomial
D) linear binomial

24) $9r^3 - r^2 + 2r$

A) quintic trinomial
B) cubic binomial
C) quartic binomial
D) cubic trinomial

25) $-4 + 6x^2 + x$

A) quadratic trinomial
B) cubic binomial
C) cubic trinomial
D) quadratic binomial

Find a quadratic model for the set of values.

26) (1, -1), (2, -5), (3, -7)

A) $y = -x^2 - 7x + 5$
B) $y = x^2 - 7x - 5$
C) $y = x^2 + 7x + 5$
D) $y = x^2 - 7x + 5$

27) (1, -4), (2, -3), (3, -4)

A) $y = -x^2 + 4x - 7$
B) $y = x^2 + 4x - 7$
C) $y = -x^2 + 4x + 7$
D) $y = -x^2 - 7x + 5$