Algebra 2 Review Name_____

Show all work on a separate sheet of paper.

Evaluate each using the values given.

1) $3-(q)(p+m-m-6)(m+q)$; use $m=3$, $p=6$, and $q=5$

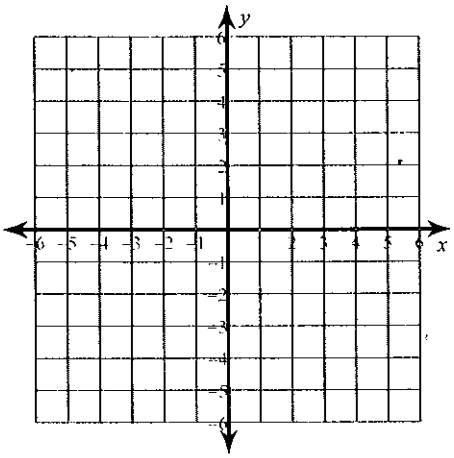
2) $y^2+y-(x+y+x-z^2)$; use $x=1$, $y=6$, and $z=2$

3) $(x+3+x)(x+y+y+z+y)$; use $x=1$, $y=1$, and $z=4$

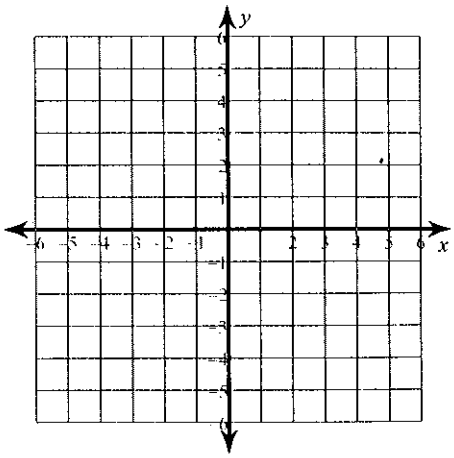
4) $(5)((h+k)(j+h)-3h)-6$; use $h=3$, $j=1$, and $k=1$

Sketch the graph of each line.

5) $y=\frac{3}{4}x+2$

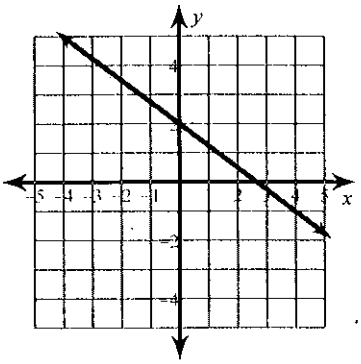


6) $y=-\frac{2}{5}x+4$



Write the slope-intercept form of the equation of each line.

7)



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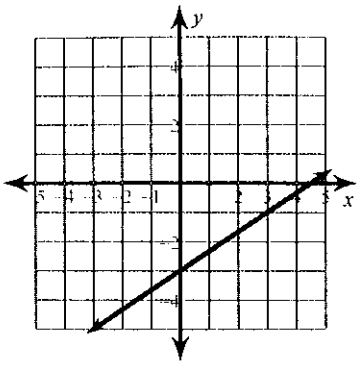


Solve each system by elimination.

9) $-11x + y = 29$
$x - 8y = 29$

10) $4x - 2y = -14$
$-12x - 5y = 9$

Solve each system by substitution.

11) $-2x + y = 10$
$2x - 7y = -22$

12) $-3x - 3y = 15$
$x - 3y = -5$

Simplify. Combine like terms and rationalize each denominator.

13) $(-5 + i)^2$

14) $(-3i)(2i) + (8i)(-5 + 3i)$

15) $(-5 - 6i) + (-7 + 5i)$

16) $-8(-5 - i) + 4(7 - 4i)$

17) $\dfrac{-3 + 6i}{2i}$

18) $\dfrac{-2 - 6i}{10 - 2i}$

19) $\dfrac{10\sqrt{2}}{\sqrt{6}}$

20) $\dfrac{\sqrt{6} - 9}{2 - \sqrt{7}}$

Factor each completely.

21) $f(x) = x^4 - 2x^3 + 2x^2$

22) $f(x) = x^3 - 1$

23) $f(x) = x^4 - x^2 - 56$

24) $f(x) = x^2 - 4x + 3$

25) $f(x) = x^3 + 4x^2 + 3x + 12$

26) $f(x) = x^5 + 2x^4 + 2x^3 + 4x^2$

27) $f(x) = x^3 + 64$

28) $f(x) = x^4 - 11x^2 + 18$

29) $f(x) = x^2 - 4x - 33$

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

31) $9b^2 - 51b + 70$

32) $9k^2 - 35k - 50$

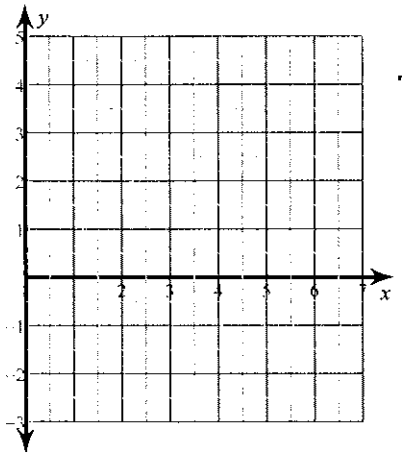
33) $10n^3 - 29n^2 + 21n$

34) $9x^2k - 51xk + 70k$

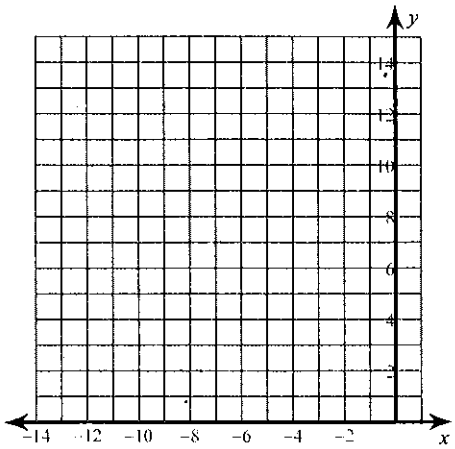
35) $60k^2 - 114k + 42$

Sketch the graph of each parabola. State the vertex, axis of symmetry and x-intercepts.

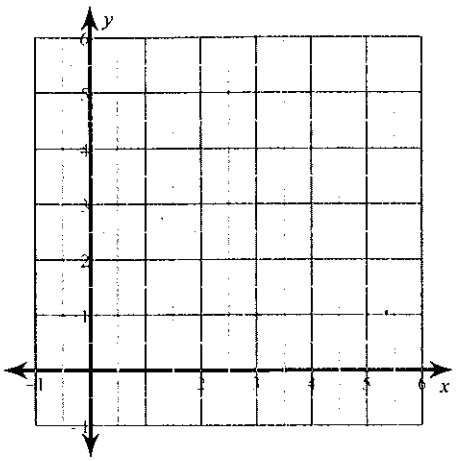
36) $y = x^2 - 8x + 15$



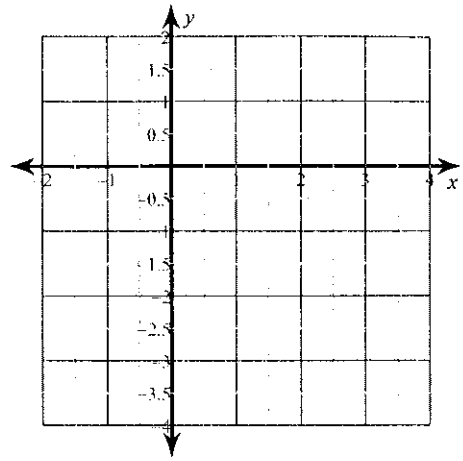
37) $y = 3x^2 + 24x + 50$



38) $y = \frac{1}{2}x^2 - 4x + 10$



39) $y = \frac{1}{2}x^2 - 2x$



Evaluate each function.

40) $f(a) = a^2 + 5$; Find $f(7)$

41) $k(x) = x^2 + x$; Find $k(-5)$

42) $h(x) = -3x - 4$; Find $h(x + 2)$

43) $k(a) = a^3 + 5 + a$; Find $k(4a)$

Simplify.

44) $\sqrt[3]{448k^2}$

45) $\sqrt[4]{324b^7}$

46) $\sqrt{252n^4}$

47) $\sqrt[5]{64x^8}$

48) $\sqrt{392x}$

49) $\sqrt[3]{135n^6}$

Write each expression in exponential form.

50) $\left(\sqrt{5x}\right)^3$

51) $\frac{1}{\sqrt[3]{5k}}$

52) $\left(\sqrt[3]{10x}\right)^2$

53) $\left(\sqrt{x}\right)^3$

54) $\dfrac{1}{\sqrt{6b}}$

Write each expression in radical form.

55) $(2a)^{\frac{5}{2}}$

56) $(5p)^{\frac{7}{4}}$

57) $r^{\frac{4}{3}}$

58) $(7x)^{\frac{4}{3}}$

59) $(5x)^{\frac{1}{4}}$

Simplify. Re-write so that the variable has a single exponent.

60) $(81n^4)^{\frac{3}{2}}$

61) $(36x^2)^{\frac{3}{2}}$

62) $(343x^6)^{\frac{1}{3}}$

63) $(n^8)^{\frac{1}{2}}$

64) $(x^4)^{\frac{3}{4}}$

Simplify each expression. Re-write as a single fraction.

65) $(9k^2 - 9k) \div \dfrac{9k^2 - 9k}{3k}$

66) $\dfrac{3b - 10}{3b^2 + 20b - 100} \div \dfrac{1}{8b^3 + 24b^2}$

67) $\dfrac{3x+2}{3x^2-10x-8}(x-2)$

68) $\dfrac{27x^3-63x^2}{9x^2} \div \dfrac{3x^2-34x+63}{7}$

69) $\dfrac{2}{36-20a} \cdot \dfrac{5a^2-4a-9}{2}$

70) $\dfrac{x-6}{3x} \cdot \dfrac{5x^2+50x+45}{5x+5}$

71) $3n^2 \cdot \dfrac{n+3}{3n^3-30n^2}$

72) $\dfrac{15m^2-75m+90}{5m-10} \div \dfrac{18m^3-54m^2}{4m^2}$

73) $\dfrac{3}{18x^3-27x^2} - 6$

74) $\dfrac{6}{2} - \dfrac{4}{2x^2-8x}$

75) $5a + \dfrac{2a}{3a^2+13a-30}$

76) $\dfrac{6}{2a+5} - \dfrac{6a}{3}$

Solve each equation. Remember to check for extraneous solutions.

77) $\dfrac{1}{6} + \dfrac{1}{3p} = \dfrac{p+5}{2p}$

78) $\dfrac{1}{6k} + \dfrac{1}{6k^2} = \dfrac{1}{2k}$

79) $\dfrac{1}{4x^2} - \dfrac{1}{4x} = \dfrac{x-4}{4x^2}$

80) $\dfrac{v-4}{3v} - \dfrac{v+3}{v} = 1$

Solve each equation.

81) $56 = -b^2 - 15b$

82) $-5a = -a^2 + 14$

83) $v^2 + 32 = 12v$

84) $a^2 - 4a = 0$

85) $6r^2 - 4 = 0$

Answers to Show all work on a separate sheet of paper.

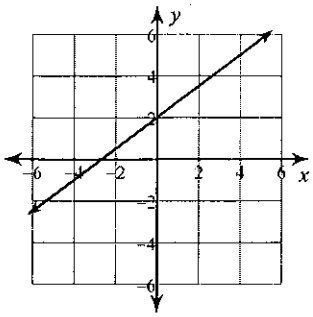
1) 3

2) 38

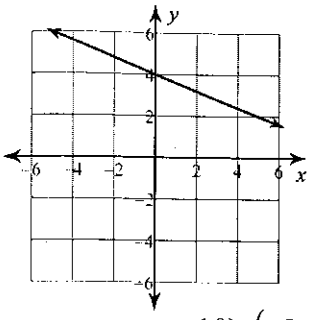
3) 40

4) 29

5)



6)



7) $y = -\frac{3}{4}x + 2$

8) $y = \frac{2}{3}x - 3$

9) $(-3, -4)$

10) $(-2, 3)$

11) $(-4, 2)$

12) $(-5, 0)$

13) $24 - 10i$

14) $-18 - 40i$

15) $-12 - i$

16) $68 - 8i$

17) $\frac{3i + 6}{2}$

18) $\frac{-1 - 8i}{13}$

19) $\frac{10\sqrt{3}}{3}$

20) $\frac{-2\sqrt{6} - \sqrt{42} + 18 + 9\sqrt{7}}{3}$

21) $f(x) = x^2(x^2 - 2x + 2)$

22) $f(x) = (x - 1)(x^2 + x + 1)$

23) $f(x) = (x^2 + 7)(x^2 - 8)$

24) $f(x) = (x - 3)(x - 1)$

25) $f(x) = (x + 4)(x^2 + 3)$

26) $f(x) = x^2(x + 2)(x^2 + 2)$

27) $f(x) = (x + 4)(x^2 - 4x + 16)$

28) $f(x) = (x^2 - 2)(x - 3)(x + 3)$

29) $f(x) = x^2 - 4x - 33$

30) $f(x) = (x - 2)(x^2 - 5)$

31) $(3b - 10)(3b - 7)$

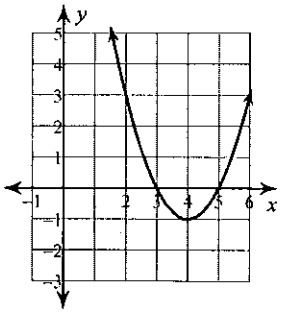
32) $(k - 5)(9k + 10)$

33) $n(5n - 7)(2n - 3)$

34) $k(3x - 7)(3x - 10)$

35) $6(5k - 7)(2k - 1)$

36)



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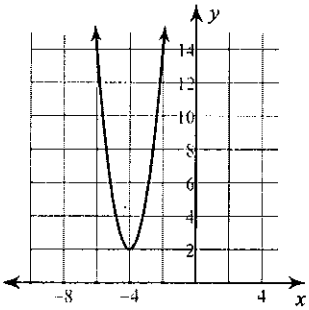

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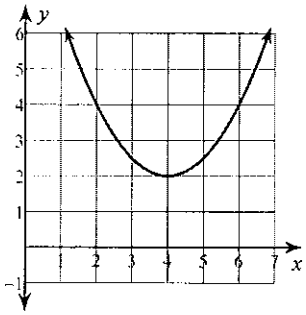

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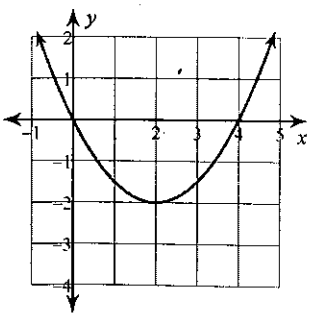

40) 54

41) 20

42) $-3x - 10$

43) $64a^3 + 5 + 4a$

44) $4\sqrt[3]{7k^2}$

45) $3b\sqrt[4]{4b^3}$

46) $6n^2\sqrt{7}$

47) $2x\sqrt[5]{2x^3}$

48) $14\sqrt{2x}$

49) $3n^2\sqrt[3]{5}$

50) $(5x)^{\frac{3}{2}}$

51) $(5k)^{-\frac{1}{3}}$

52) $(10x)^{\frac{2}{3}}$

53) $x^{\frac{3}{2}}$

54) $(6b)^{-\frac{1}{2}}$

55) $\left(\sqrt{2a}\right)^5$

56) $\left(\sqrt[4]{5p}\right)^7$

57) $\left(\sqrt[3]{r}\right)^4$

58) $\left(\sqrt[3]{7x}\right)^4$

59) $\sqrt[4]{5x}$

60) $729n^6$

61) $216x^3$

62) $7x^2$

63) n^4

64) x^3

65) $3k$

66) $\dfrac{8b^2(b+3)}{b+10}$

67) $\dfrac{x-2}{x-4}$

68) $\dfrac{7}{x-9}$

69) $\dfrac{-a-1}{4}$

70) $\dfrac{(x-6)(x+9)}{3x}$

71) $\dfrac{n+3}{n-10}$

72) $\dfrac{2}{3}$

73) $\dfrac{-36x^3+54x^2+1}{3x^2(2x-3)}$

74) $\dfrac{3x^2-12x-2}{x(x-4)}$

75) $\dfrac{15a^3+65a^2-148a}{(3a-5)(a+6)}$

76) $\dfrac{-4a^2-10a+6}{2a+5}$

77) $\left\{-\dfrac{13}{2}\right\}$

78) $\left\{\dfrac{1}{2}\right\}$

79) $\left\{\dfrac{5}{2}\right\}$

80) $\left\{-\dfrac{13}{5}\right\}$

81) $\{-7, -8\}$

82) $\{7, -2\}$

83) $\{8, 4\}$

84) $\{4, 0\}$

85) $\left\{\dfrac{\sqrt{6}}{3}, -\dfrac{\sqrt{6}}{3}\right\}$