Intermediate Algebra (B)
Review Tri B

Name ANSWER KEY
Class period 1 2 3 4 5

Quadratic Formula:	When given	$ax^2+bx+c=0$	then	$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

1. Solve the equation by factoring. $x^2+4x-45=0$

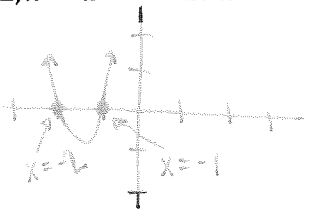
a. $x=9, x=5$ (b.) $x=-9, x=5$ c. $x=9, x=-5$ d. $x=-9, x=-5$

$(x+9)(x-5)=0$

$x+9=0$ $\quad x-5=0$
$-9\ -9$ $\quad +5\ +5$
$x=-9$ $\quad x=5$

2. Solve the equation by graphing. $x^2+3x+2=0$

a. $x=2, x=1$ b. $x=-2, x=1$ c. $x=2, x=-1$ (d.) $x=-2, x=-1$



3. Solve the equation by using square roots. $2x^2+16=32$

$-16\ -16$
$\frac{2x^2}{2}=\frac{16}{2}$
$x^2=8$

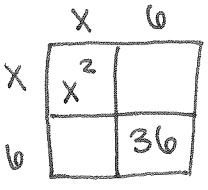
$\sqrt{x^2}=\sqrt{8}$
$|x|=\sqrt{4}\sqrt{2}$
$|x|=2\sqrt{2}$

$x=2\sqrt{2}$
$x=-2\sqrt{2}$

a. $x=\sqrt{8}, x=-\sqrt{8}$ (b.) $x=2\sqrt{2}, x=-2\sqrt{2}$ c. $x=4\sqrt{2}, x=-4\sqrt{2}$ d. $x=2\sqrt{4}, x=-2\sqrt{4}$

4. Find the value of b that makes the expression a perfect square trinomial. $x^2+bx+36$

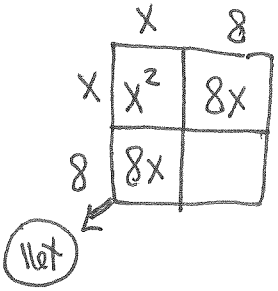
a. 18 (b.) 12 c. 6 d. 4



$(x+6)(x+6)$
$x^2+6x+6x+36$
$x^2+12x+36$

5. Find the value of c that makes the expression a perfect square trinomial. $x^2+16x+c$

a. 4 b. 8 c. 256 (d.) 64



$(x+8)(x+8)$
$x^2+8x+8x+64$
$x^2+16x+64$

Quadratic Formula:	When given	$ax^2 + bx + c = 0$	then	$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

6. Simplify the radical. $\sqrt{12x^4}$

a. $12x^2$ b. $3x^2\sqrt{2}$ c. $2x^2\sqrt{3}$ d. $4x^2\sqrt{3}$

$\sqrt{12} = \sqrt{4}\sqrt{3}$
$= 2\sqrt{3}$
$\sqrt{x^4} = x^{4/2} = x^2$

7. Simplify the radical. $\sqrt{-75}$

a. $i\sqrt{75}$ b. $5\sqrt{3}$ c. $5i\sqrt{3}$ d. $3i\sqrt{5}$

$\sqrt{-75} = \sqrt{-1}\sqrt{25}\sqrt{3}$
$5i\sqrt{3}$

8. Solve by using the quadratic formula. $4x^2 + 4x = 2$

$-2 \quad -2$
$4x^2 + 4x - 2 = 0$

$a = 4$
$b = 4$
$c = -2$

$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(4)(-2)}}{2(4)} = \frac{-4 \pm \sqrt{48}}{8}$
$= \frac{-4 \pm 4\sqrt{3}}{8}$
$= \frac{-1 \pm \sqrt{3}}{2}$

a. $-1 \pm 2\sqrt{3}$ b. $-2 \pm \sqrt{3}$ c. $\frac{-1 \pm 4\sqrt{3}}{2}$ d. $\frac{-1 \pm \sqrt{3}}{2}$

9. The discriminant tells us the _____

i. number of zero's. ii. the number and type of solutions. iii. number of x-intercepts.

iv. where the quadratic crosses the x-axis. v. the solutions.

a. i and ii b. i and iii c. iv and v d. i , ii, iii e. i, ii, iii, iv, v

10. If the discriminant is positive and a perfect square then the roots are _____?

a. Complex b. Real & Irrational c. Real & Rational

11. If the discriminant is positive and not a perfect square then the roots are _____?

a. Complex b. Real & Irrational c. Real & Rational

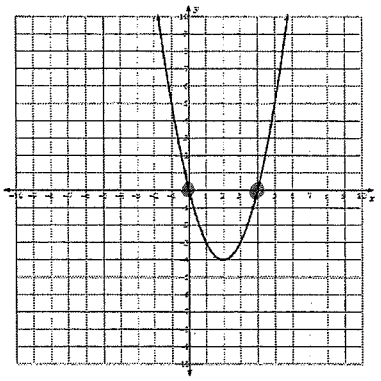
12. If the discriminant is zero then the roots are _____?

a. Complex b. Real & Irrational c. Real & Rational

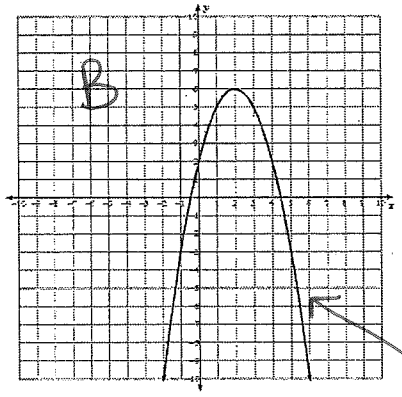
Quadratic Formula:	When given	$ax^2 + bx + c = 0$	then	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

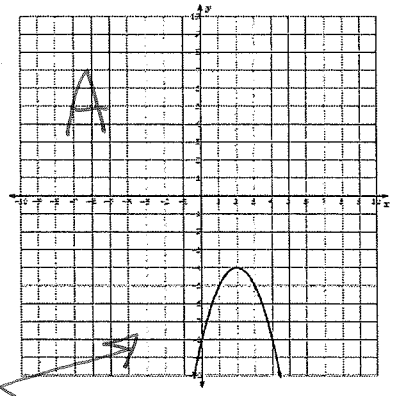
13. The graph to the right has how many solutions?

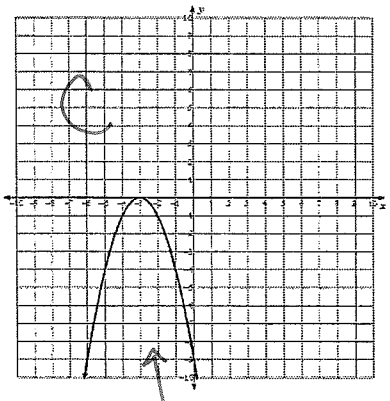
a. one (b. two) c. zero d. cannot determine



14. Match the graph to the value of the discriminant.







a. Negative b. Positive c. Zero

15. If the discriminant is negative then the roots are _____?

(a. Complex) b. Real & Irrational c. Real & Rational

16. Calculate the discriminant to the equation $y = 4x^2 - 2x + 5$

a. 84 b. 76 c. -84 (d. -76)

$a = 4$
$b = -2$
$c = 5$

$(-2)^2 - 4(4)(5) = -76$

17. Simplify the expression. $(x^3)^2$

a. x^5 (b. x^6) c. x^9 d. x

Power to a Power
$3 \cdot 2 = 6$

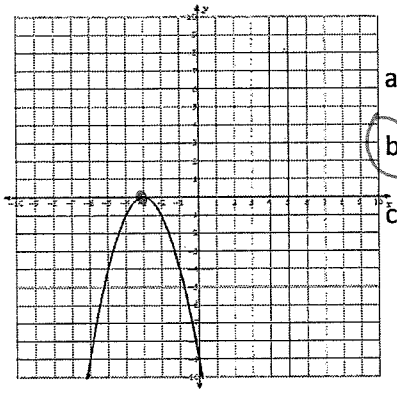
18. Simplify the expression. $(x^2)(x^3)$

(a. x^5) b. x^6 c. x^9 d. x

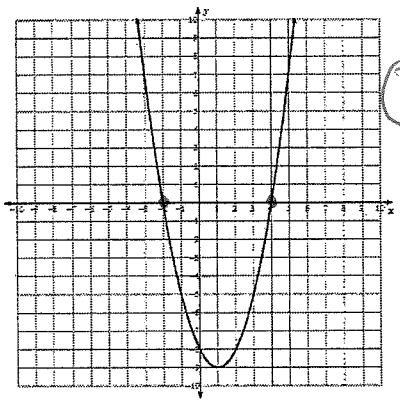
Product of Powers
$2 + 3 = 5$

Quadratic Formula:	When given	$ax^2 + bx + c = 0$	then	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

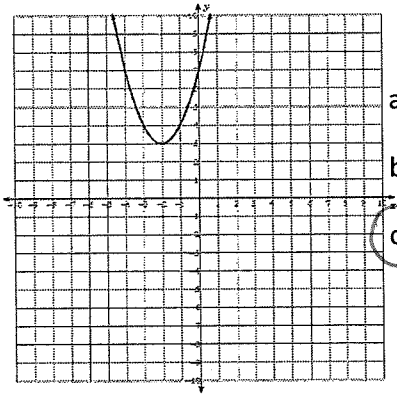
19. Match the graph to the type and number of roots the equation would have.



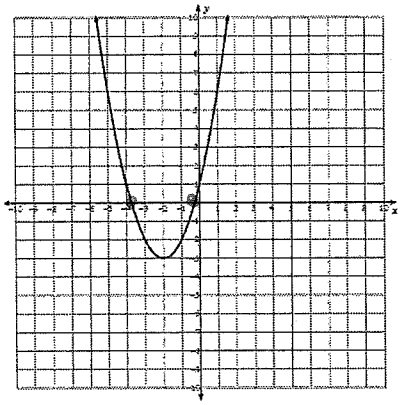
a. 2 Real Numbers
b. 1 Real Number
c. 2 Complex Numbers



a. 2 Real Numbers
b. 1 Real Number
c. 2 Complex Numbers



a. 2 Real Numbers
b. 1 Real Number
c. 2 Complex Numbers



a. 2 Real Numbers
b. 1 Real Number
c. 2 Complex Numbers

20. Simplify the expression. $x^{\frac{1}{3}} \cdot x^{\frac{1}{4}}$

a. $x^{\frac{1}{7}}$ b. $x^{\frac{2}{7}}$ c. $x^{\frac{1}{12}}$ d. $x^{\frac{7}{12}}$

Product of Powers
$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

21. Simplify and rewrite in radical form. $x^2 x^{\frac{4}{5}}$

a. $\sqrt[5]{x^8}$ b. $\sqrt[10]{x^8}$ c. $\sqrt[5]{x^4}$ d. $\sqrt[5]{x^{14}}$

Product of Powers
$2 + \frac{4}{5} = \frac{10}{5} + \frac{4}{5} = \frac{14}{5}$

22. Simplify and rewrite in radical form. $\left(x^{\frac{2}{3}} x^{\frac{4}{5}}\right)^{\frac{5}{2}} = x^{\frac{10}{6}} x^{\frac{20}{10}} = x^{\frac{5}{3}} x^{\frac{2}{1}}$

a. $\sqrt[3]{x^{11}}$ b. $\sqrt[11]{x^3}$ c. $\sqrt[30]{x^{119}}$ d. $\sqrt[3]{x^4}$

Product of Powers
$\frac{5}{3} + \frac{2}{1} = \frac{5}{3} + \frac{6}{3} = \frac{11}{3}$

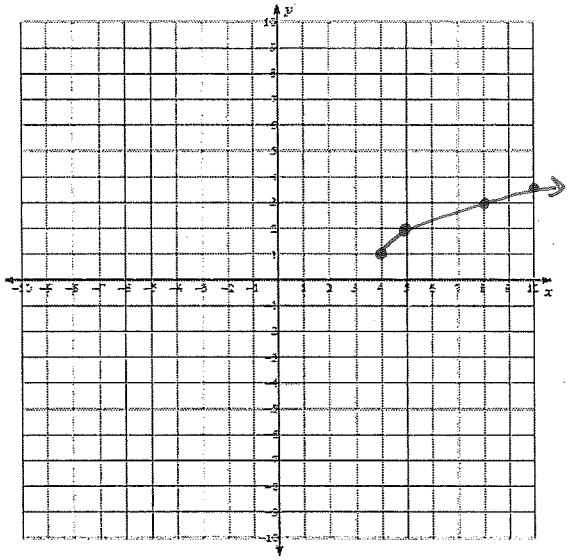
Quadratic Formula:	When given	$ax^2 + bx + c = 0$	then	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

23. Graph the function $y = \sqrt{x - 4} + 1$. What is the starting point?

a. (-4, 1) b. (4, 1) c. (-4,-1) d. (-4, -1)

starting point →

x	y
4	1
5	2
8	3
10	3.45



24. What is the domain and range for the previous graph?

a. Domain: $x \geq -4$, Range: $y \geq 1$ b. Domain: $x \geq 4$, Range: $y \geq 1$

c. Domain: $x \geq -4$, Range: $y \geq -1$ d. Domain: $x \geq -4$, Range: $y \geq -1$

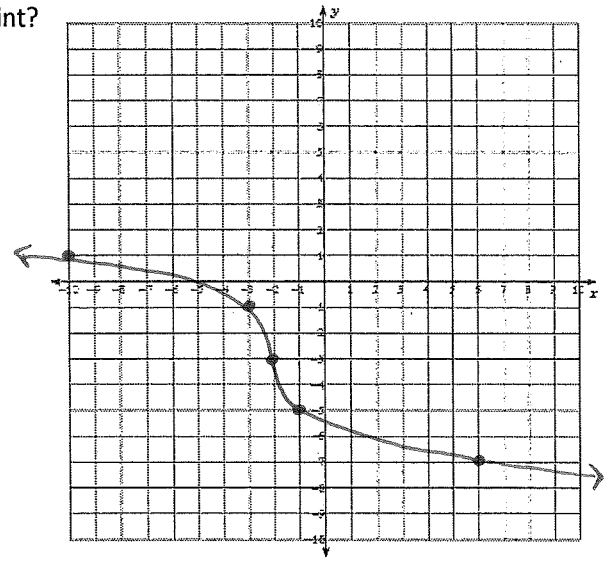
e. Domain: $x = All\ Real\ Numbers$, Range: $y = All\ Real\ Numbers$

25. Graph the function $y = -2\sqrt[3]{x + 2} - 3$. What is the inflection point?

a. (-2, 3) b. (2, 3) c. (-2,-3) d. (2, -3)

inflection point →

x	y
-10	1
-3	-1
-2	-3
-1	-5
6	-7



26. What is the domain and range for the previous problem?

a. Domain: $x \geq -2$, Range: $All\ Real\ Numbers$ b. Domain: $x \geq -2$, Range: $y \leq -3$

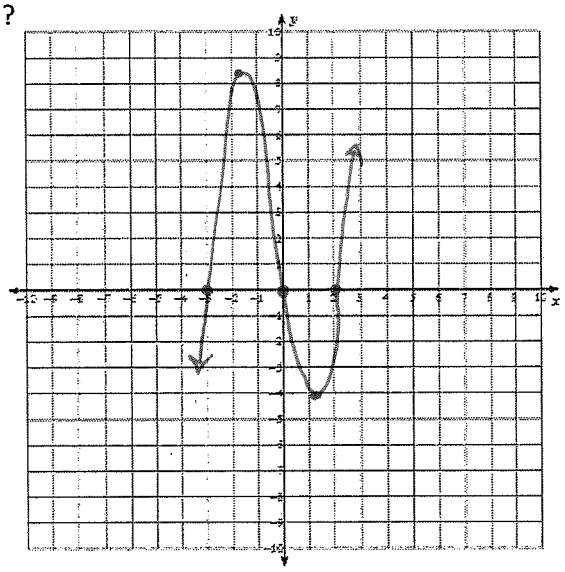
c. Domain: $All\ Real\ Numbers$, Range: $y \geq -3$ d. Domain: $x \leq -2$, Range: $y \leq -3$

e. Domain: $x = All\ Real\ Numbers$, Range: $y = All\ Real\ Numbers$

Quadratic Formula: When given $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

27. Graph the function $y = x^3 + x^2 - 6x$. What is the relative maximum?

a. (2, 8) b. (-2, 8) c. (-1.78, 8.21) d. (-1.78, -8.21)



x	y
-3	0
Relative max → -1.78	8.21
0	0
Relative min → 1.12	-4.06
2	0

28. What is the domain and range for the previous question?

a. Domain: $x \geq -2$, Range: $y \geq 8$

b. Domain: $x \geq -1.78$, Range: $y \leq 8.21$

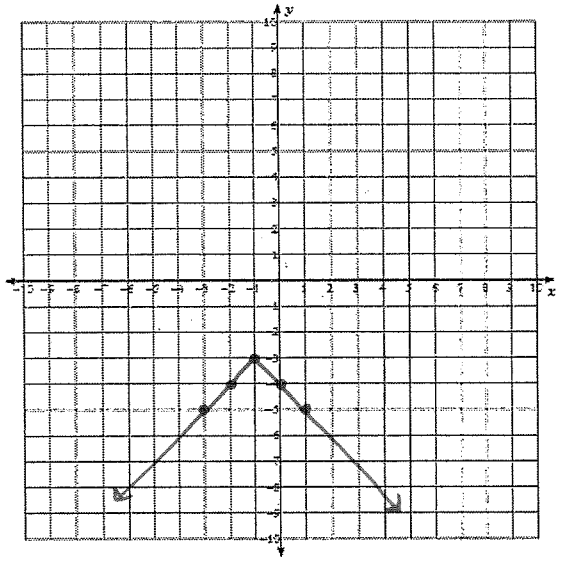
c. Domain: $x \leq -2$, Range: $y \geq -8$

d. Domain: $x \leq -1.78$, Range: $y \leq -8.21$

e. Domain: $x = All\ Real\ Numbers$, Range: $y = All\ Real\ Numbers$

29. Graph the function $y = -|x + 1| - 3$. What is the vertex?

a. (-1, 3) b. (1, 3) c. (-1,-3) d. (1, -3)



x	y
-3	-5
-2	-4
vertex → -1	-3
0	-4
1	-5

30. What is the domain and range for the previous problem?

a. Domain: $x \geq -1$, Range: $All\ Real\ Numbers$

b. Domain: $x \geq 1$, Range: $All\ Real\ Numbers$

c. Domain: $All\ Real\ Numbers$, Range: $y \geq -3$

d. Domain: $All\ Real\ Numbers$, Range: $y \leq -3$

e. Domain: $x = All\ Real\ Numbers$, Range: $y = All\ Real\ Numbers$

Quadratic Formula:	When given	$ax^2+bx+c=0$	then	$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

31. Simplify the expression. $(4x^3-3x^2+7)+(2x^2-5x^3-9)$

(a.) $-x^3-x^2-2$ b. $6x^5-8x^5-2$ c. $6x^3-8x^2-2$ d. $-4x^5$

combine like terms: $4x^3+-5x^3=-1x^3$
$-3x^2+2x^2=-1x^2$
$7+-9=-2$

32. Simplify the expression. $(4x^3-3x^2+7)-(3x^2-5x-9)$

a. $4x^3+5x+16$ b. $4x^3-6x^2-5x+16$ (c.) $4x^3-6x^2+5x+16$ d. $4x^3-6x^2+5x-2$

combine like terms: $4x^3-0x^3=4x^3$
$-3x^2-3x^2=-6x^2$
$0x--5x=5x$
$7--9=16$

33. Find the product. $(2x^2-4x+3)(3x-4)$

(a.) $6x^3-20x^2+25x-12$ b. $6x^3-4x^2+25x-12$ c. $5x^3-20x^2+25x-12$ d. $11x^2-12$

distribute: $(2x^2-4x+3)(3x-4)$

$6x^3-8x^2-12x^2+16x+9x-12$

$6x^3-20x^2+25x-12$

34. Divide. $(x^3+8x^2+9x-18)\div(x-1)$

a. $x^2+7x+2+\frac{-20}{x-1}$ b. $x^2+7x+2+\frac{-16}{x-1}$ (c.) $x^2+9x+18$ d. x^2+9x+0

1	1	8	9	-18
	↓	1	9	18
	1	9	18	0

35. Divide. $(x^3+3x^2+4x-5)\div(x+3)$

(a.) $x^2+4+\frac{-17}{x+3}$ b. $x^2+4+\frac{-7}{x+3}$ c. $x^2+6x+22+\frac{61}{x+3}$ d. $x^2+6x+22+\frac{71}{x+3}$

-3	1	3	4	-5
	↓	-3	0	-12
	1	0	4	-17

Quadratic Formula:	When given	$ax^2+bx+c=0$	then	$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

36. Divide. $(x^3+4x+16)\div(x+2)$ ← $0x^2$

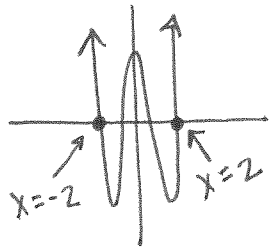
a. $x+6+\frac{28}{x+2}$ b. $x^2+2x+8+\frac{32}{x+2}$ c. x^2+2x+8 (d.) x^2-2x+8

$$\begin{array}{r|cccc} -2 & 1 & 0 & 4 & 16 \\ & \downarrow & -2 & 4 & -16 \\ \hline & 1 & -2 & 8 & 0 \end{array}$$

37. Find all of the zeros of $f(x)=5x^4-24x^2+16$ ← $0x^3$ ← $0x$

a. $2,-2,\frac{\sqrt{6}}{3},\frac{-\sqrt{6}}{3}$ b. $2,-2,\frac{2\sqrt{5}}{5},\frac{-2\sqrt{5}}{5}$ c. $2,-2,\ 1,-1$ d. $2,-3,\frac{2\sqrt{5}}{5},\frac{-2\sqrt{5}}{5}$

Graph:



$$\begin{array}{r|ccccc} -2 & 5 & 0 & -24 & 0 & 16 \\ & \downarrow & -10 & 20 & 8 & -16 \\ \hline & 5 & -10 & -4 & 8 & 0 \end{array}$$

$$\begin{array}{r|cccc} 2 & 5 & -10 & -4 & 8 \\ & \downarrow & 10 & 0 & -8 \\ \hline & 5 & 0 & -4 & 0 \end{array}$$

$f(x)=5x^2-4$

$5x^2-4=0$

$+4\quad +4$

$\frac{5x^2}{5}=\frac{4}{5}$

$\sqrt{x^2}=\sqrt{\frac{4}{5}}$

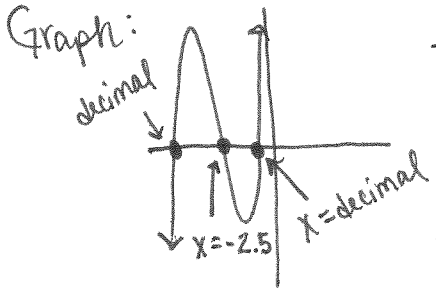
$|x|=\frac{\sqrt{4}}{\sqrt{5}}=\frac{2}{\sqrt{5}}\cdot\frac{\sqrt{5}}{\sqrt{5}}$

$x=\pm\frac{2\sqrt{5}}{5}$

38. Find all of the zeros of $f(x)=2x^3+23x^2+39x-15$

a. $\frac{-5}{2},-4+\sqrt{19},-4-\sqrt{19}$ b. $\frac{-5}{2},\frac{-9+\sqrt{65}}{2},\frac{-9-\sqrt{65}}{2}$ (c.) $\frac{-5}{2},\frac{-9+\sqrt{93}}{2},\frac{-9-\sqrt{93}}{2}$ d. $\frac{-5}{2},\frac{-9+\sqrt{77}}{2},\frac{-9-\sqrt{77}}{2}$

Graph:



$$\begin{array}{r|cccc} -2.5 & 2 & 23 & 39 & -15 \\ & \downarrow & -5 & -45 & 15 \\ \hline & 2 & 18 & -6 & 0 \end{array}$$

$-\frac{5}{2}=-2.5$

$f(x)=2x^2+18x-6$

$a=2$
$b=18$
$c=-6$

$x=\frac{-(18)\pm\sqrt{(18)^2-4(2)(-6)}}{2(2)}$

$x=\frac{-18\pm\sqrt{372}}{4}$

$x=\frac{-18\pm2\sqrt{93}}{4}=\frac{-9\pm\sqrt{93}}{2}$

Quadratic Formula:	When given	$ax^2 + bx + c = 0$	then	$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

39. Solve the equation $21 = 4x^{\frac{2}{3}} + 5$

a. x = 2 b. x = 4 c. $x = 4\sqrt{2}$ (d.) x = 8

$21 = 4x^{\frac{2}{3}} + 5$

$-5 \quad -5$

$\frac{16}{4} = \frac{4x^{\frac{2}{3}}}{4}$

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

$8 = x$

Check: $21 = 4(8)^{\frac{2}{3}} + 5$ ✓

40. Solve the equation $\sqrt{2x^2 + 51} + 1 = 0$

a. x = 5 b. x = -5 c. x = 5, x = -5 (d.) no solution

$\sqrt{2x^2+51} + 1 = 0$

$-1 \quad -1$

$(\sqrt{2x^2+51})^2 = (-1)^2$

$2x^2 + 51 = 1$

$-51 \quad -51$

$\frac{2x^2}{2} = \frac{-50}{2}$

$\sqrt{x^2} = \sqrt{-25}$

$|x| = 5i$

$x = \pm 5i$

Check: $\sqrt{2(5i)^2+51} + 1 = 0$

$2 = 0$ No!

$\sqrt{2(-5i)^2+51} + 1 = 0$

$2 = 0$ No!

41. Solve the equation algebraically $|2x - 4| - 7 = -1$

a. x = 5 b. x = -1 (c.) x = 5, x = -1 d. no solution

$|2x-4| - 7 = -1$

$+7 \quad +7$

$|2x-4| = 6$

$2x - 4 = 6$

$+4 \quad +4$

$\frac{2x}{2} = \frac{10}{2}$

$x = 5$

$2x - 4 = -6$

$+4 \quad +4$

$\frac{2x}{2} = \frac{-2}{2}$

$x = -1$

Check: $|2(5)-4| - 7 = -1$

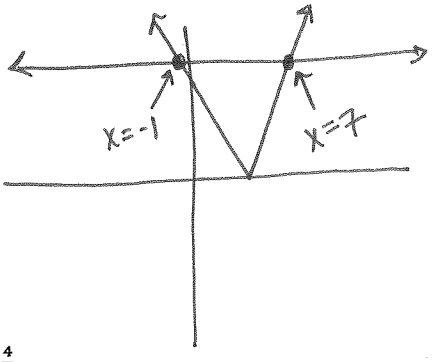
$-1 = -1$ ✓

$|2(-1)-4| - 7 = -1$

$-1 = -1$ ✓

42. Solve the equation graphically $5|9 - 3x| = 60$

a. x = 7 b. x = -1 (c.) x = 7, x = -1 d. no solution



43. The population for rural towns in MN is represented by the equation $P = 1.32x^{\frac{4}{3}}$ where x is the number of homes in the town. If the population of a town is 825, how many homes are there?

a. 825 homes b. 10214 homes c. 5344 homes (d.) 125 homes

$\frac{825}{1.32} = \frac{1.32x^{\frac{4}{3}}}{1.32}$

$(625)^{\frac{3}{4}} = (x^{\frac{4}{3}})^{\frac{3}{4}}$

$125 = x$

— OR —