

Accelerated Pre-Calculus
Solving Review 1.5, 1.6, 1.8, 1.9, 1.11

Name Key
 Period

1. Solve by factoring: A) $2y^2 = -7y - 3$ $2y^2 + 7y + 3 = 0$
 $(2y + 1)(y + 3) = 0$
 $y = -1/2 \text{ and } -3$

B) $4x^2 - 4x - 15 = 0$ $4x^2 - 4x - 15 = 0$
 $(2x + 3)(2x - 5) = 0$
 $x = -3/2 \text{ and } 5/2$

2. Solve by completing the square: A) $x^2 + 22x + 21 = 0$
 $x^2 + 22x + 121 + 21 + 121 = 0$
 $(x + 11)^2 - 100 = 0$
 $(x + 11)^2 = 100$
 $x + 11 = \pm 10$
 $x = -11 \pm 10$

B) $4x^2 - 8x - 1 = 0$
 $4(x^2 - 2x + 1) - 1 - 4 = 0$
 $4(x - 1)^2 = 5$
 $(x - 1)^2 = 5/4$
 $x - 1 = \pm \sqrt{5}/2 + 1$
 $x = 1 \pm \frac{\sqrt{5}}{2} + 1$
 $x = 2 \pm \frac{\sqrt{5}}{2}$

3. Solve using the quadratic formula:

A) $5x^2 - 7x + 1 = 0$
 $7 \pm \sqrt{49 - 4 \cdot 5 \cdot 1} / 10 = \frac{7 \pm \sqrt{29}}{10}$

B) $10y^2 - 16y + 5 = 0$
 $16 \pm \sqrt{256 - 4 \cdot 10 \cdot 5} / 20 = \frac{16 \pm \sqrt{56}}{20} = \frac{16 \pm 2\sqrt{14}}{20}$

4. Solve. A) $\frac{1}{x-1} + \frac{1}{x+2} = \frac{5}{4}$
 $4(x-1)(x+2) + 4(x-1)(x+2) = 5(x-1)(x+2)$
 $4x + 8 + 4x - 4 = 5x^2 + 5x - 10$
 $0 = 5x^2 - 3x - 14$
 $0 = (5x + 7)(x - 2)$
 $x = -7/5 \text{ and } 2$

B) $2x + \sqrt{x+1} = 8$
 $(\sqrt{x+1})^2 = (8 - 2x)^2$
 $x + 1 = 64 - 32x + 4x^2$
 $0 = 4x^2 - 33x + 63$
 $(4x - 21)(x - 3) = 0$
 $x = 3 \text{ and } 21/4$

C) $|2x + 3| = 3$
 $2x + 3 = 3$ $2x + 3 = -3$
 $2x = 0$ $2x = -6$
 $x = 0$ $x = -3$

D) $x + 4\sqrt{x} - 5 = 0$
 let $u = \sqrt{x}$
 $u^2 + 4u - 5 = 0$
 $(u + 5)(u - 1) = 0$
 $u = -5 \text{ or } 1$
 $\sqrt{x} = -5$ NP
 $\sqrt{x} = 1$
 $x = 1$

Simplify

5. $(3 + 6i) - (-4 - 5i)$
 $3 + 6i + 4 + 5i$
 $7 + 11i$

6. $(3 - 2i) + (4 + 3i)$
 $7 + i$

7. $(-7 + 2i)(-2 + 3i)$
 $14 - 25i + 6i^2$
 $8 - 25i$

8. $i^{48} (i^2)^{24}$
 1

9. i^{25}
 $i \cdot (i^2)^{12}$
 $i \cdot 1 = i$

10. $(\sqrt{2} - \sqrt{-2})(\sqrt{8} + \sqrt{-2})$
 $(\sqrt{2} - i\sqrt{2})(2\sqrt{2} + i\sqrt{2})$
 $4 + 2i - 4i - 2i^2$
 $6 - 2i$

11. $\sqrt{-10} \cdot \sqrt{-8}$
 $i\sqrt{10} \cdot 2i\sqrt{2}$
 $-2i^2 \sqrt{20}$
 $4\sqrt{5}$

12. $\frac{2-3i}{4-i} \cdot \frac{4+i}{4+i}$
 $\frac{8 - 10i + 3i^2}{16 + i^2} = \frac{11 - 10i}{17}$

Solve

13. $2x^2 + 4x + 3 = 0$
 $-4 \pm \sqrt{16 - 4 \cdot 2 \cdot 3} / 4 = \frac{-4 \pm \sqrt{-8}}{4}$
 $-4 \pm 2i\sqrt{2} = -2 \pm i\sqrt{2}$

14. $x^2 + 12 = 0$ $x^2 = -12$
 $x = \pm \sqrt{-12}$
 $x = \pm 2i\sqrt{3}$

15. $-16x^2 - 25 = 0$
 $x^2 = -25/16$
 $x = \pm \frac{5i}{4}$

Solve the inequality. Express the solution using interval notation.

16. $7x - 5 \geq 6x + 4$

$x \geq 9$

$[9, \infty)$

17. $9 < 3x + 6 < 15$

$3 < 3x < 9$

$1 < x < 3$

$(1, 3)$

18. $|x - 2| \geq 4$

$x - 2 \geq 4 \cup x - 2 \leq -4$

$x \geq 6 \cup x \leq -2$

$(-\infty, -2] \cup [6, \infty)$

19. $2|x + 1| + 1 \leq 5 \quad 2|x + 1| \leq 4$

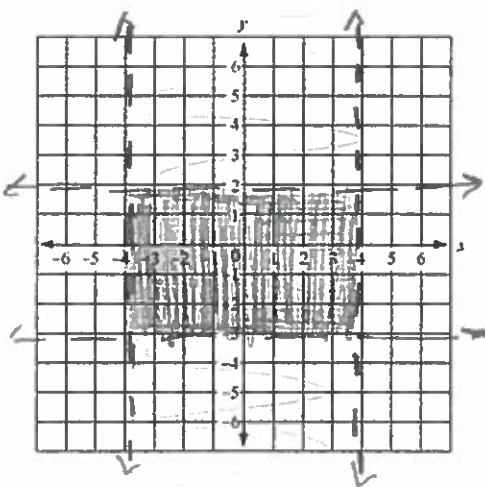
$|x + 1| \leq 2$

$x + 1 \leq 2 \cap x + 1 \geq -2$
 $x \leq 1 \cap x \geq -3 \quad -3 \leq x \leq 1$

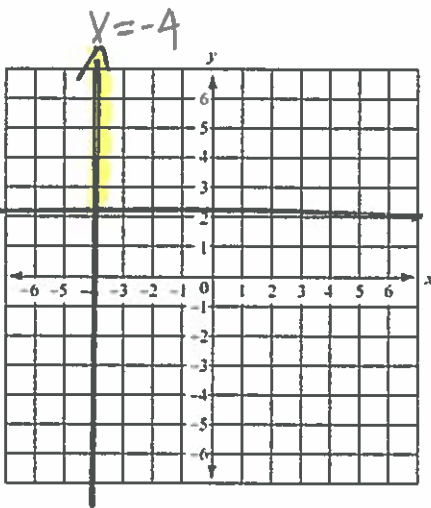
$[-3, 1]$

Graph

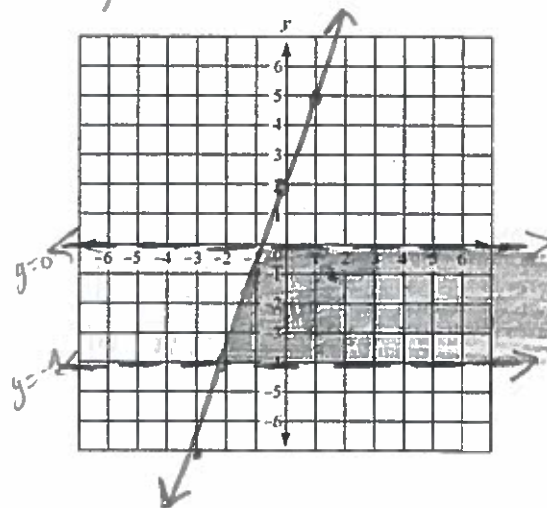
20. $\{(x, y) | -4 < x < 4 \text{ \& } -2 < y < 2\}$



21. $\{(x, y) | x = -4 \text{ or } y \geq 2\}$



22. $\{(x, y) | y - 3x \leq 2 \text{ \& } -4 < y < 0\}$
 $y \leq 3x + 2$



Test the equations for x-axis, y-axis and origin symmetry. (Show your work for each)

23. $6x + y^2 = 36$

a.) x-axis symmetry?

$6x + (-y)^2 = 36$

Yes

$6x + y^2 = 36$

b.) y-axis symmetry?

$6(-x) + y^2 = 36$

No

$-6x + y^2 = 36$

c.) Origin symmetry?

$-6x + y^2 = 36$

No

24. $x^3 + xy^2 = 5$

a.) $x^3 + x(-y)^2 = 5$

Yes

$x^3 + xy^2 = 5$

b.) $(-x)^3 + (-x)y^2 = 5$

$-x^3 - xy^2 = 5$

No

c.) $(-x)^3 + (-x)(-y)^2 = 5$

$-x^3 - xy^2 = 5$

No

25. $y = 9 - x^2$

a.) $-y = 9 - x^2 \rightarrow y = -9 + x^2$

No

b.) $y = 9 - (-x)^2 \rightarrow y = 9 - x^2$

Yes

c.) $-y = 9 - (-x)^2$

$-y = 9 - x^2$

No

Use your graphing calculator to solve the following.

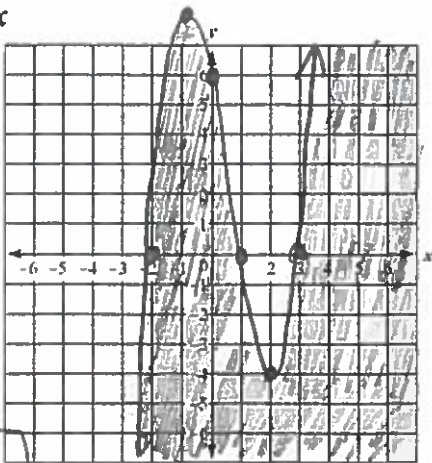
26. $x^3 - 2x^2 + 6 \geq 5x$

$x^3 - 2x^2 - 5x + 6 \geq 0$

X	Y
-2	0
-1	8
0	6
1	0
2	-4
3	0

$(0, 0) \rightarrow 6 \geq 0$

$[-2, 1] \cup [2, 3]$



27. $x^2 - 3x \leq 4$

$x^2 - 3x - 4 \leq 0$

$[-1, 4]$

