

BASIC ALGEBRA Exam 4 (One Step Ch 4) FORMS A and B Dr. Rapalje

SHOW ALL WORK AS NECESSARY ON THIS TEST OR ON SEPARATE PAPER.
CALCULATORS ARE ALLOWED ON THIS TEST, BUT YOU MUST SHOW ALL WORK.

In 1 - 8, graph the equations and inequalities. (Show work for partial credit!)

1. $y = -2x - 2$

2. $y = 3x$

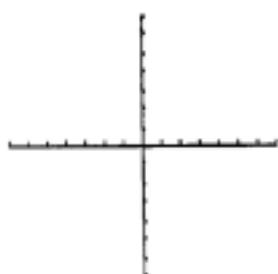
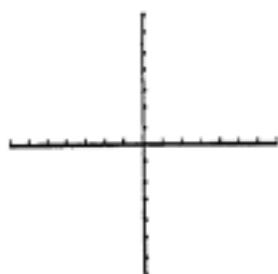
3. $y = -\frac{2}{3}x + 3$



4. $-3x + 2y = 6$

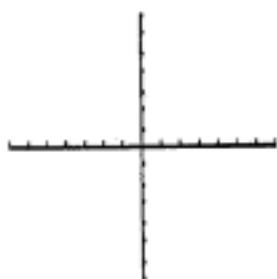
5. $3x - 2y = -6$

6. $y = -2$



7. $y \leq -\frac{3}{5}x$

8. $3x - 2y > -6$



In 9 - 14, find the slope and the y-intercept.

9. $y = 3/2x$

slope = _____

Y-int = _____

10. $y = x - 6$

slope = _____

Y-int = _____

11. $y = -x + 2$

slope = _____

Y-int = _____

12. $-2x + 5y = -10$

slope = _____

Y-int = _____

13. $x - 4y = -8$

slope = _____

Y-int = _____

14. A vertical line

slope = _____

Y-int = _____

slope = _____

In 15 - 16, give the X and Y-intercepts.

15. $-3x + 2y = 12$

16. $y = -4x - 8$

In 17 - 20, find the slope between the two points.

17. (2, 5) and (6, -1)

18. (-2, 5) and (-4, -3)

19. (-2, 5) and (4, -3)

20. (3, 5) and (3, 7)

In 21 - 23, find the equation of a line in slope-intercept ($y = mx + b$) form.

21. with slope 4, passing through (-3, -2).

22. with slope -2, passing through (-3, 2)

23. with slope -5/3, passing through (5, -8).

In 24 - 26, solve the systems of equations. (Show all work using methods from algebra!)

$$24. \begin{aligned} x - 3y &= 5 \\ 2x + 3y &= -17 \end{aligned}$$

$$25. \begin{aligned} 3y - 2x &= 10 \\ x &= 4y - 15 \end{aligned}$$

$$26. \begin{aligned} -5x + 2y &= -8 \\ 10x - 4y &= 16 \end{aligned}$$

$$27. \begin{aligned} 5x + 3y &= 14 \\ 9x + 4y &= 7 \end{aligned}$$

$$28. \text{ If } f(x) = -3x + 4 ,$$

$$29. \text{ If } g(x) = \frac{2x}{x + 2} ,$$

$$\text{a)} \quad f(0) =$$

$$\text{a)} \quad g(1) =$$

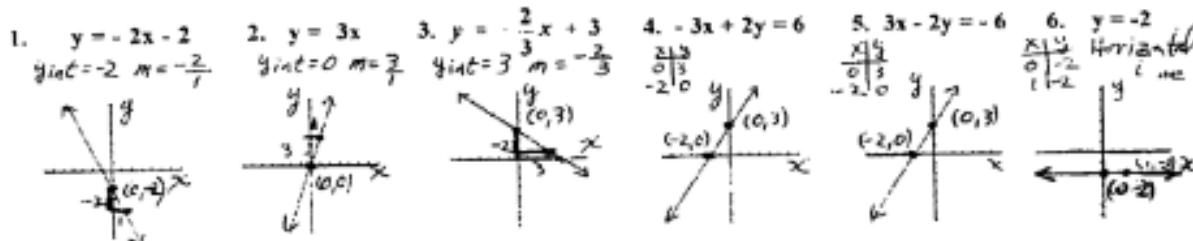
$$\text{b)} \quad f(2) =$$

$$\text{b)} \quad g(-2) =$$

$$\text{c)} \quad f(-2) =$$

$$\text{c)} \quad g(0) =$$

BASIC ALGEBRA EXAM 4A* Solutions



7. $y \leq -\frac{3}{5}x + \frac{5}{5}$: Graph of a solid line passing through (0, 1) and (5, 0). The region below and to the left of the line is shaded.
 $y_{int} = 0$, $m = -\frac{3}{5}$

8. $3x - 2y > 6$: Graph of a dashed line passing through (0, 3) and (2, 0). The region above and to the right of the line is shaded.
 $y_{int} = 3$, $m = \frac{3}{2}$

9. $y = \frac{3}{2}x$: Graph of a line passing through (0, 0) and (2, 3).
 $y_{int} = 0$, $m = \frac{3}{2}$

10. $y = x - 6$: Graph of a line passing through (6, 0) and (0, -6).
 $y_{int} = -6$, $m = 1$

11. $y = -x + 2$: Graph of a line passing through (2, 0) and (0, 2).
 $y_{int} = 2$, $m = -1$

12. $-2x + 5y = -10$:
 $\frac{5y}{5} = \frac{-10}{-2}$
 $y = \frac{2}{5}x - 2$

13. $x - 4y = -8$:
 $\frac{x}{4} - \frac{4y}{4} = \frac{-8}{4}$
 $y = \frac{1}{4}x + 2$

14. Vertical: $m = \text{undefined}$

15. $-3x + 2y = 12$:
 $y_{int} = 6$, $m = -\frac{3}{2}$
 $-3x = 12$
 $x = -4$

16. $y = -4x - 8$:
 $y_{int} = -8$, $m = -4$
 $4x = -8$
 $x = -2$

17. $m = \frac{y_2 - y_1}{x_2 - x_1}$:
 $(2, 5)$, $(6, -1)$
 $5 - (-1) = 6$
 $6 - 2 = 4$
 $m = \frac{6}{4} = \frac{3}{2}$

18. $(-2, 5)$, $(-4, -3)$:
 $m = \frac{-3 - 5}{-4 - (-2)} = \frac{-8}{-2} = 4$

19. $(-2, 5)$, $(4, \frac{1}{3})$:
 $m = \frac{\frac{1}{3} - 5}{4 - (-2)} = \frac{-\frac{14}{3}}{6} = -\frac{7}{9}$

20. $(3, 5)$, $(3, 7)$:
 $m = \frac{7 - 5}{3 - 3} = \frac{2}{0}$
 $\text{Underline } 0.$

21. $m = 4$:
 $y = mx + b$
 $-2 = 4(-3) + b$
 $-2 = -12 + b$
 $+12 + 12$
 $10 = b$
 $y = 4x + 10$

22. $m = -2$:
 $y = mx + b$
 $2 = (-2)(-3) + b$
 $2 = 6 + b$
 $-6 - 6$
 $-4 = b$
 $y = -2x - 4$

23. $m = -\frac{5}{3}$:
 $y = mx + b$
 $3(-8) = -\frac{5}{3}(5) + b$
 $-24 = -\frac{25}{3} + b$
 $-24 + 25 = -\frac{25}{3}$
 $1 = \frac{1}{3}$
 $y = -\frac{5}{3}x + \frac{1}{3}$

24. $x - 3y = 5$:
 $2x + 3y = -17$
 $3x = -12$
 $x = -4$
 $-4 - 3y = 5$
 $+4 + 4$
 $-3y = 9$
 $y = -3$
 $\text{Ch: } 2(-4) + 3(-3) = -17$
 $-8 - 9 = -17$

25. $3y - 2x = 10$:
 $x = 4y - 15$
 $3y - 2(4y - 15) = 10$
 $3y - 8y + 30 = 10$
 $-5y = -20$
 $y = 4$
 $x = 4(4) - 15$
 $x = 1$
 $\text{Ch: } 3(4) - 2(1) = 10$
 $12 - 2 = 10$

26. $-5x + 2y = -8$:
 $10x - 4y = 16$
 $-10x + 4y = -16$
 $10x - 4y = 16$
 $0 = 0$
 SAME LINE

27. $5x + 3y = 14$:
 $-3(9x + 4y = 7)$
 $20x + 12y = 56$
 $-27x - 12y = -21$
 $-7x = 35$
 $x = -5$

28. $f(x) = -3x + 4$:
 a) $f(0) = -3(0) + 4$
 $= 4$
 b) $f(2) = -3(2) + 4$
 $= -2$
 c) $f(-2) = -3(-2) + 4$
 $= 10$

29. $g(x) = \frac{2x}{x+2}$:
 a) $g(1) = \frac{2(1)}{1+2} = \frac{2}{3}$
 b) $g(-2) = \frac{2(-2)}{-2+2} = \text{undefined}$
 c) $g(0) = \frac{2(0)}{0+2} = 0$
 $y = 13$
 $\text{Ch: } g(-5) + g(13) = 7$
 $-45 + 52 = 7$

Basic Algebra Exam 4B*

Name_____

**SHOW ALL WORK AS NECESSARY ON THIS TEST OR ON SEPARATE PAPER.
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In 1 - 8, graph the equations and inequalities. (Show work for partial credit!)

1. $y = 3x - 2$

2. $y = -3x + 2$

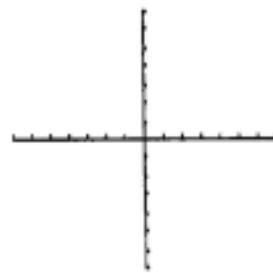
3. $y = \frac{2}{3}x - 3$



4. $3x - 2y = 6$

5. $3x + 2y = -6$

6. $x = -2$



7. $y \geq -\frac{4}{3}x + 3$

8. $3x - 2y < -6$



In 9 - 14, find the slope and the y-intercept.

9. $y = 3x + 4$

slope = _____

Y-int = _____

10. $y = -x - 2$

slope = _____

Y-int = _____

11. $y = x$

slope = _____

Y-int = _____

12. $5x + 2y = 10$

slope = _____

Y-int = _____

13. $6x - 3y = 9$

slope = _____

Y-int = _____

14. A horizontal line

slope = _____

In 15 - 16, give the X and Y-intercepts.

15. $3x - 6y = 12$

16. $y = 4x - 8$

In 17 - 20, find the slope between the two points.

17. (2, 5) and (6, 1)

18. (-2, 7) and (4, -2)

19. (3, 5) and (3, 7)

20. (3, 5) and (7, 5)

In 21 - 23, find the equation of a line in slope-intercept ($y = mx + b$) form.

21. with slope 3, passing through (4, 2).

22. with slope -3, passing through (-4, -2).

23. with slope -3/4, passing through (5, -6).

In 24 - 26, solve the systems of equations. (Show all work using methods from algebra!)

$$24. \quad \begin{aligned} 2x + y &= 8 \\ x - y &= 1 \end{aligned}$$

$$25. \quad \begin{aligned} y &= 8 - 2x \\ 5x + 3y &= 19 \end{aligned}$$

$$26. \quad \begin{aligned} 5x - 2y &= 8 \\ 10x - 4y &= 8 \end{aligned}$$

$$27. \quad \begin{aligned} 3x - 5y &= -3 \\ 2x + 3y &= 17 \end{aligned}$$

$$28. \quad \text{If } f(x) = 3x + 4 ,$$

$$\text{a)} \quad f(0) =$$

$$\text{b)} \quad f(2) =$$

$$\text{c)} \quad f(-2) =$$

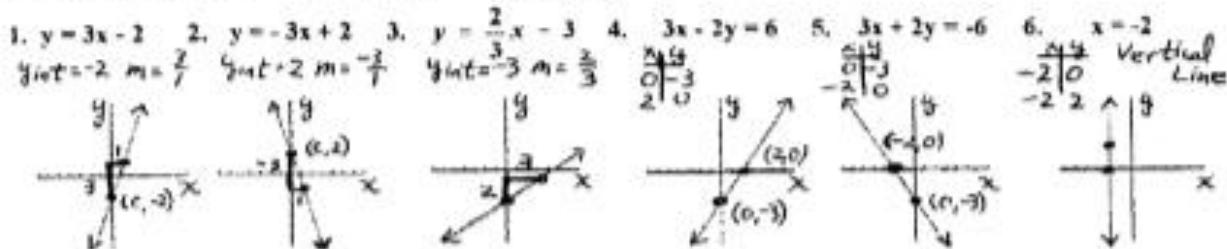
$$29. \quad \text{If } g(x) = \frac{3x - 5}{2x} ,$$

$$\text{a)} \quad g(1) =$$

$$\text{b)} \quad g(4) =$$

$$\text{c)} \quad g(0) =$$

BASIC ALGEBRA EXAM 4B* Solutions



7. $y \geq \frac{4}{3}x + 3$ 8. $3x - 2y < -6$ 9. $y = 3x + 4$ 10. $y = -x - 2$ 11. $y = x$

12. $5x + 2y = 10$ 13. $6x - 3y = 9$ 14. Horizontal

$$\begin{aligned} 2y &= -5x + 10 \\ y &= -\frac{5}{2}x + 5 \end{aligned}$$

$$\begin{aligned} -3y &= -6x + 9 \\ y &= 2x - 3 \end{aligned}$$

15. $3x - 6y = 12$ 16. $y = 4x - 8$

$$\begin{aligned} 3x &= 6y + 12 \\ x &= 2y + 4 \\ y &= 0 \\ y_{int} &= 0 \\ x_{int} &= 4 \\ 0 &= 4x - 8 \\ 8 &= 4x \\ 2 &= x \end{aligned}$$

$$\begin{aligned} y &= 0 \\ y_{int} &= 0 \\ x_{int} &= 2 \\ 0 &= 4x - 8 \\ 8 &= 4x \\ 2 &= x \end{aligned}$$

17. $m = \frac{3x - 4}{x_2 - x_1}$ 18. $(-2, 7)$ $(4, -2)$ 19. $(3, 5)$ $(3, 7)$

$$\begin{aligned} m &= \frac{3(4) - 4}{4 - (-2)} \\ &= \frac{12 - 4}{6} \\ &= \frac{8}{6} \\ &= \frac{4}{3} \end{aligned}$$

$$\begin{aligned} m &= \frac{7 - 5}{3 - 3} \\ &= \frac{-2}{0} \\ &= \text{undefined} \end{aligned}$$

20. $2x + y = 8$ 21. $x - y = 1$

$$\begin{aligned} x - y &= 1 \\ 2x - 2y &= 2 \\ 2x + y &= 8 \\ -2y &= -6 \\ y &= 3 \end{aligned}$$

22. $m = -3$ $(-4, 2)$ 23. $m = -\frac{7}{4}$ $(5, -6)$ 24. $2x + y = 8$

$$\begin{aligned} y &= mx + b \\ y &= -3x + b \\ -2 &= -3(-4) + b \\ -2 &= 12 + b \\ -14 &= b \\ y &= -3x - 14 \end{aligned}$$

$$\begin{aligned} y &= mx + b \\ y &= -\frac{7}{4}(5) + b \\ -6 &= -\frac{35}{4} + b \\ -6 &= -8.75 + b \\ b &= 2.75 \\ y &= -\frac{7}{4}x + 2.75 \end{aligned}$$

$$\begin{aligned} x - y &= 1 \\ 2x - 2y &= 2 \\ 2x + y &= 8 \\ -3y &= -6 \\ y &= 2 \end{aligned}$$

25. $\begin{cases} 2x + y = 8 \\ 5x + 3y = 19 \end{cases}$ 26. $\begin{cases} 5x - 2y = 8 \\ 10x + 4y = -16 \end{cases}$ 27. $\begin{cases} 3x - 5y = -3 \\ 2(2x + 3y = 17) \end{cases}$ 28. $f(x) = 3x + 4$

$$\begin{aligned} -6x - 3y &= -24 \\ 5x + 3y &= 19 \\ -x &= -5 \\ x &= 5 \\ 2x + y &= 8 \\ 2(5) + y &= 8 \\ 10 + y &= 8 \\ y &= -2 \end{aligned}$$

No Solution
Parallel Lines

$$\begin{aligned} 10x - 4y &= 8 \\ 10x - 4y &= -16 \\ 0 &= -8 \end{aligned}$$

$$\begin{aligned} 6x - 10y &= -6 \\ -6x - 9y &= -51 \\ -12y &= -57 \\ y &= 3 \end{aligned}$$

$$\begin{aligned} f(1) &= 3(1) + 4 = 7 \\ f(2) &= 3(2) + 4 = 10 \\ f(-2) &= 3(-2) + 4 = -2 \end{aligned}$$

29. $g(x) = \frac{3x - 5}{2x}$ 30. $g(x) = \frac{3(1) - 5}{2(1)} = \frac{-2}{2} = -1$

$$\begin{aligned} g(0) &= \frac{3(0) - 5}{2(0)} = \text{undefined} \\ g(2) &= \frac{3(2) - 5}{2(2)} = \frac{1}{4} \end{aligned}$$