Final Exam Review 110

All Final Exam Reviews hosted by the Math Success Center (LAC) and the Multidisciplinary Success Center (PCC) are FREE for Long Beach City College students. The materials will cover topics from Math 110, 110A*, and 110B** continuously. During these reviews we will be using this form of the review materials, copies will NOT be provided so make sure you print/bring your own copy of this review or a computer to view the material digitally.

* If you are enrolled in Math 110A, some of the materials covered will exceed your course and it is your responsibility to focus on content relating to your class only.

** If you are enrolled in Math 110B, remember that the Final Exam for Math 110B reflects materials from 110A and 110B.

The schedule of upcoming Final Exam Reviews are posted on http://www.lbcc.edu/math/Finals.cfm. You can reserve your spot by contacting or visiting the appropriate success center.

Contents

Simplifying Expressions

1. Simplify completely. Write with positive exponents ONLY.

   a) $\left(\frac{2y^3}{xz^{-2}}\right)^3$

   b) $\left(\frac{4x^{-3}y}{x^{-1}}\right)^{-2}$

   c) $\sqrt{40x^5}$

2. Factor completely.

   a) $8x^2 + 2x - 3$

   b) $25x^2 - 4$

   c) $x^2 - 5x + 6$

   d) $2x^2 + 7xy + 3y^2$

3. Perform the operations, write without parenthesis, and simplify completely.

   a) $2x + 5 - (3x - 4)$

   b) $(3x - 4)(2x + 1)$

   c) $(4x^2 + 2x - 1)(3x + 2)$

   d) $(6x - 5)^2$

   e) $\sqrt{50} + \sqrt{32} + \sqrt{72}$

   f) $\sqrt{2}(4 - \sqrt{6})$

4. Perform the operations, simplify completely.

   a) $\dfrac{y^2 + 5y - 14}{y^2 + 4y - 21}$

   b) $\dfrac{3x-1}{x+2} - \dfrac{x-5}{x+2}$

   c) $\dfrac{2y^2 - y - 1}{y^2 - 2y + 1} \cdot \dfrac{y^2 + 2y - 3}{2y^2 + 7y + 3}$

   d) $\dfrac{x^2 - 25}{x^2 - 2x - 3} \div \dfrac{x^2 - 3x - 10}{x^2 - 8x - 20}$

   e) $\dfrac{13}{x^2 - 5x + 6} - \dfrac{5}{x - 3}$

   f) $\dfrac{5x}{x(x-1)} + \dfrac{6-x}{(x-1)(x+2)}$

5. Rationalize each denominator. Simplify completely.

   a) $\dfrac{6}{\sqrt{7}}$

   b) $\dfrac{2}{3 - \sqrt{2}}$

Solving Equations

6. Solve each equation. Simplify completely

   a) $x + 2(x - 5) = 14$

   b) $\dfrac{y}{4} + 2 = \dfrac{y}{2} + \dfrac{1}{3}$

   c) $0.12p + 0.04(12 - p) = 0.09(12)$

7. Solve each system of equations, if possible.

   a) $\begin{aligned} 2x + y &= -10 \\ 3x + 2y &= -14 \end{aligned}$

   b) $\begin{aligned} 2x - 7y &= 3 \\ -5x + 3y &= 7 \end{aligned}$

   c) $\begin{aligned} y &= -2x - 1 \\ 4x + 2y &= 5 \end{aligned}$

8. Solve the inequality. Plot solution on number line.

   a) $\dfrac{7 - 2x}{3} < -5$

   b) $2(3 - x) \leq 4x + 8$

9. Solve each equation. Simplify completely

   a) $6x^2 + 11x - 7 = 0$

   b) $y^2 = 36$

   c) $x^2 = 5x$

   d) $z(z - 5) = 14$

   e) $3x^2 + 7x - 4 = 0$

10. Solve each equation. Check your answers.

    a) $\dfrac{10}{x^2 - 25} = \dfrac{3}{x + 5} + \dfrac{1}{x - 5}$

    b) $\dfrac{4y}{y - 3} - 3 = \dfrac{3y - 1}{y + 3}$

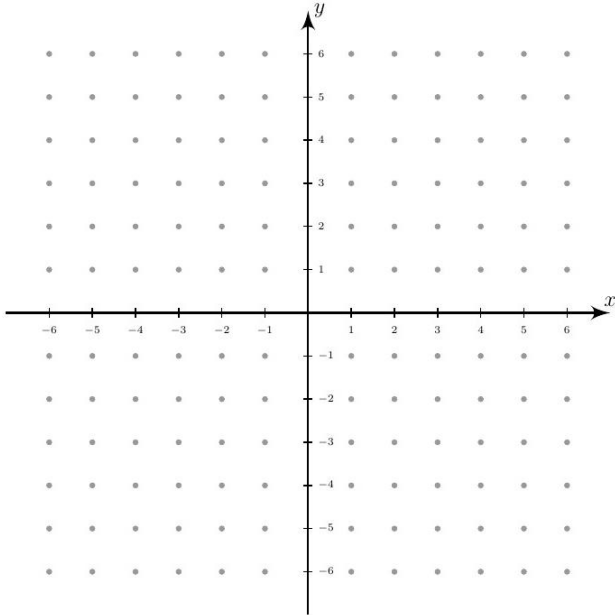   c) $\sqrt{y - 1} = y - 3$
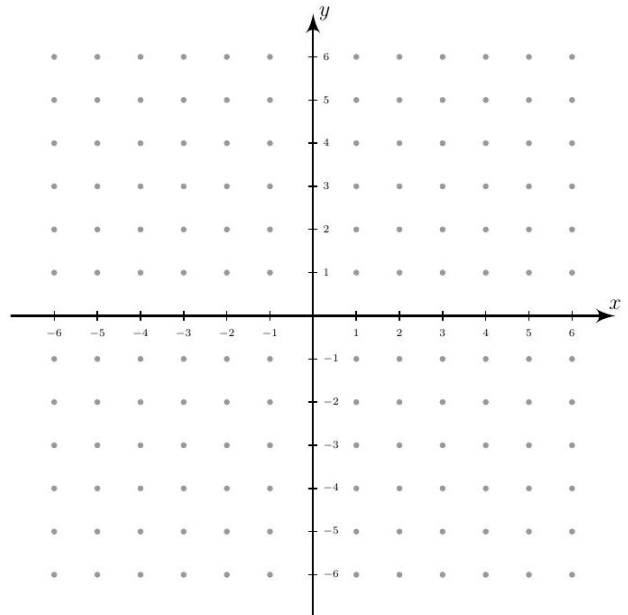
    d) $x = \sqrt{2 - x} - 4$

Working with Lines

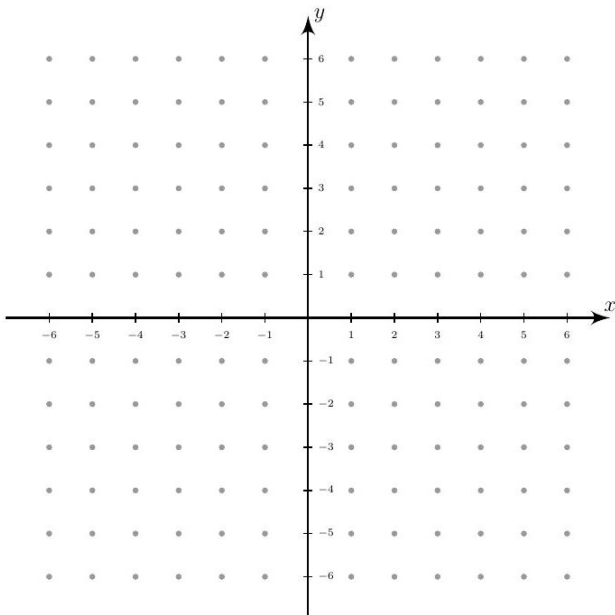11. Sketch the graph of each line.

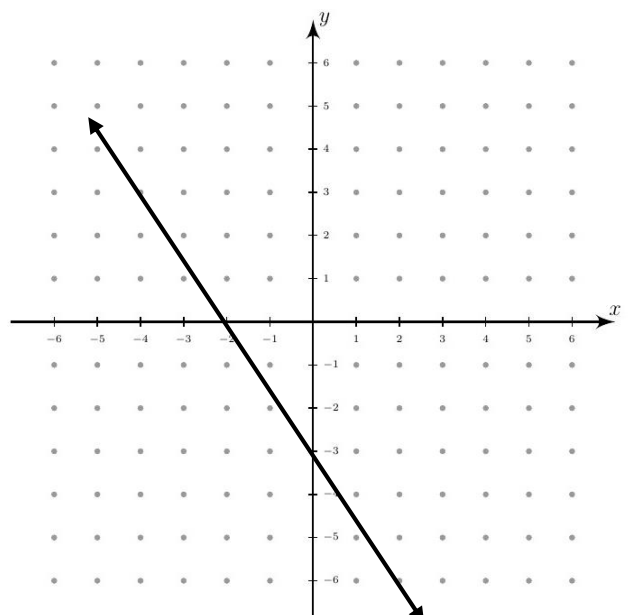a) The line with slope $\frac{5}{7}$ passing through $(-3, -4)$.

b) Graph the line of $2x - 3y = 12$

c) Graph the line of $y = \frac{4}{3}x - 2$

12. Find the equation of the line shown below.
    Write in $y = mx + b$ form

13. Find the equation of each line. Write in $y = mx + b$ form.

   a. The line with slope $m = \frac{1}{6}$ passing through the point $(2, -3)$

   b. The line passing through the points $(2, -3)$ and $(-1, 8)$.

Word Opportunities

14. Joan and Frank have $86 total between the both of them. If Joan has $5 more than twice the amount of money Frank has. How much money do each of them have?

15. Maggie counts a total of 120 coins in her piggy bank, all quarters and dimes. If she has a total of $25.50, how many of each coin does she have in the piggy bank?

16. Two investments produce an annual interest income of $4200. The amount invested in 14% is $6000 less than the amount invested in 10%. Find the amount invested in each account?

17. Anne is a chemist, she want to mix a 40% acid solution and a 60% acid solution to make 100 liters of a 55% acid solution. How many liters of each solution should she mix together?

18. From a point on a straight road, Tom and Michael start at the same time and bicycle in opposite directions. Tom rides 10 miles per hour and Michael rides 12 miles per hour. In how many hours will they be 55 miles apart?

19. Shantal and Elizabeth are training together for a marathon. Shantal runs at a rate pf 6 miles per hour and Elizabeth runs at a rate of 7.2 miles per hour. If the start a training run at the same time running in the same direction, in how much time will they be 0.3 miles apart?

20. A boat can travel 48 miles downstream in 3 hours. If it takes the boat 8 hours to make the return trip back upstream, find the speed of the rive current.

21. A plane can travel 300 miles flying against the wind in the same amount of time it takes to travel 420 miles when flying with the wind. If the speed of the wind is 30 mph, find the speed of the plane without the wind?

22. The distance between town A and town B is 280 miles. On a certain map, this distance is represented by 4 inches. On the same map, town C and town D are 10 inches apart. What is the actual distance between towns C and D?

23. Karen and Bill are computer programmers for the same company. If Karen can complete a programing job in three hours and Bill can do the job in six hours, how long would it take them to do the job working together?

Solutions - Simplifying Expressions

1. Simplify completely. Write with positive exponents ONLY.

   a) $\dfrac{8y^9z^6}{x^3}$

   b) $\dfrac{x^4}{16y^2}$

   c) $2x^2\sqrt{10x}$

2. Factor completely.

   a) $(4x+3)(2x-1)$

   c) $(x-3)(x-2)$

   b) $(5x+2)(5x-2)$

   d) $(2x+y)(x+3y)$

3. Perform the operations, write without parenthesis, and simplify completely.

   a) $-x+9$

   d) $36x^2-60x+25$

   b) $6x^2-5x-4$

   e) $15\sqrt{2}$

   c) $12x^3+14x^2+x-2$

   f) $4\sqrt{2}-2\sqrt{3}$

4. Perform the operations, simplify completely.

   a) $\dfrac{y-2}{y-3}$

   d) $\dfrac{(x+5)(x-10)}{(x-3)(x+1)}$ or $\dfrac{x^2-5x-50}{x^2-2x-3}$

   b) 2

   e) $\dfrac{23-5x}{(x-3)(x-2)}$ or $\dfrac{23-5x}{x^2-5x+6}$

   c) 1

   f) $\dfrac{4(x+4)}{(x-1)(x+2)}$ or $\dfrac{4x+16}{x^2+x-2}$

5. Rationalize each denominator. Simplify completely.

   a) $\dfrac{6\sqrt{7}}{7}$

   b) $\dfrac{6+2\sqrt{2}}{7}$

Solutions - Solving Equations

6. Solve each equation. Simplify completely

   a) $x = 8$

   b) $y = \frac{20}{3}$

   c) $p = \frac{15}{2}$ or $p = 7.5$

7. Solve each system of equations, if possible.

   a) $x = -6 \ and \ y = 2$

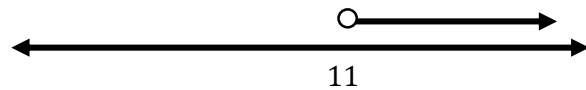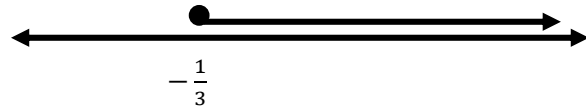   b) $x = -2 \ and \ y = -1$

   c) No Solution

8. Solve the inequality. Plot solution on number line.

   a) $x > 11$

   b) $x \geq -\frac{1}{3}$

9. Solve each equation. Simplify completely

   a) $x = \frac{1}{2}$ or $x = -\frac{7}{3}$

   b) $y = \pm 6$

   c) $x = 0 \ or \ x = 5$

   d) $z = 7 \ or \ z = -2$

   e) $x = \frac{-7 \pm \sqrt{97}}{6}$

10. Solve each equation. Check your answers.
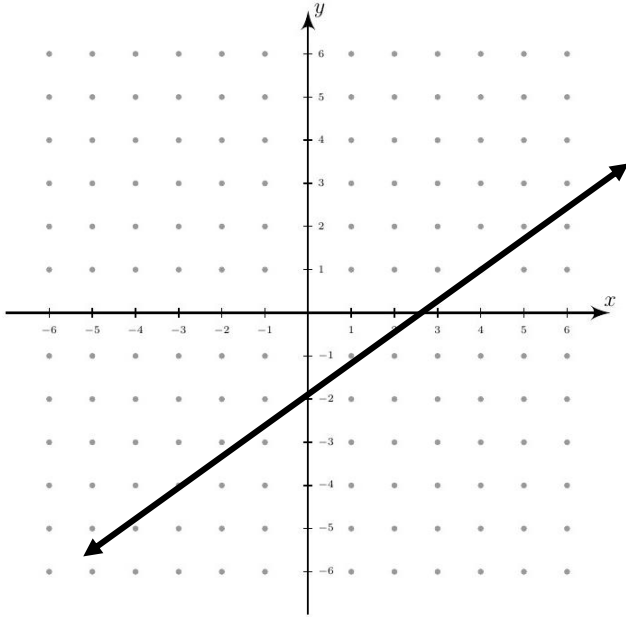
    a) No Solution.

    b) $y = 12 \ or \ y = -1$
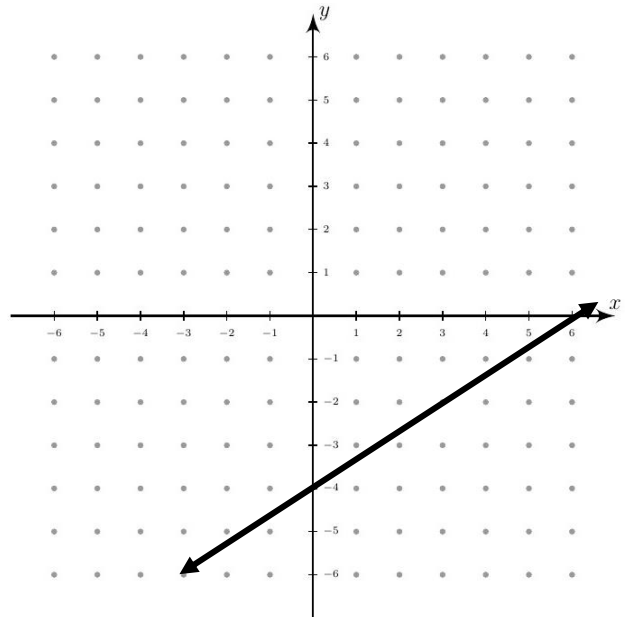
    c) $y = 5$

    d) $x = -2$

Solutions - Working with Lines

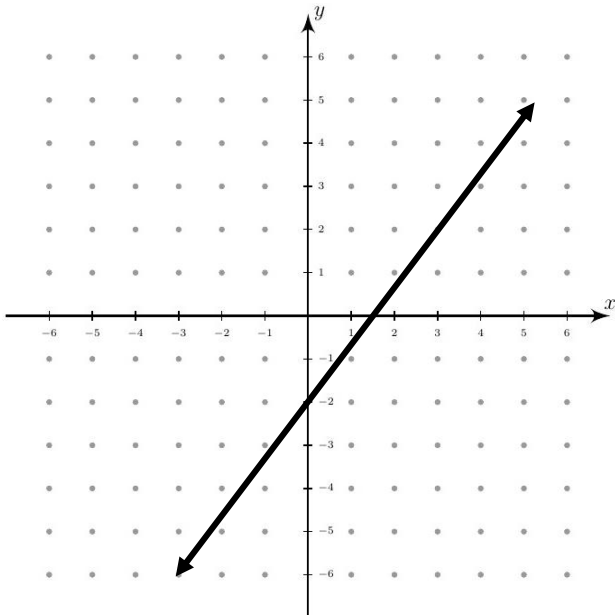11. Sketch the graph of each line.

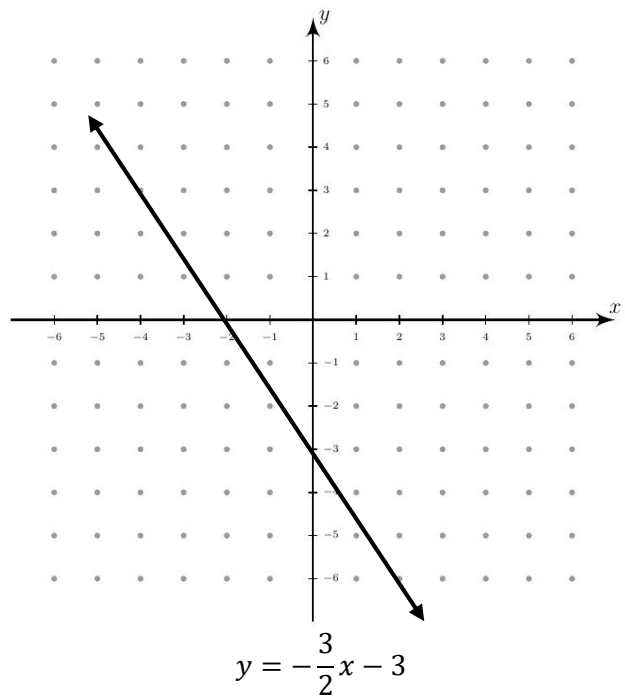a) The line with slope $\frac{5}{7}$ passing through $(-3, -4)$.

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12. Find the equation of the line shown below.
Write in $y = mx + b$ form

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

13. Find the equation of each line. Write in $y = mx + b$ form.

    a. $y = \frac{1}{6}x - \frac{10}{3}$

    b. $y = -\frac{11}{3}x + \frac{13}{3}$

Solutions - Word Opportunities

14. Frank has $27 and Joan has $59.

15. Maggie has 90 quarters and 30 dimes

16. The amount invested in 10% is $21,000 and the amount invested in 14% is $15,000.

17. Anne needs 25 liters of 40% acid solution and 75 liters of 60% acid solution

18. Tom and Michael will be 55 miles apart in 2.5 hours (or 2 hours 30 minutes)

19. Elizabeth will be 0.3 miles ahead of Shantal in 0.25 hours (or 15 minutes)

20. The speed of the river current is 5 miles per hour (the speed of the boat is 11 miles per hour)

21. The speed of the plane without the wind is 180 miles per hour

22. Towns C and D are 700 miles apart.

23. It would take 2 hours to complete one programming job together.