

Montgomery College
Department of Mathematics
Rockville Campus

MA 091 ICL
PREPARATIONS AND REVIEW FOR EXAM 3
Bring a ruler for graphing lines when you take exam number 3.

STUDY QUESTIONS

1. What would you do to help you decide whether or not the point $(4, -3)$ lies on the line $2x - y = 11$?
2. (a) If an equation has the form $y = mx + b$, what should you expect the graph to look like?
(b) Rewrite the equation $5x - 2y = 10$ in the form $y = mx + b$.
(c) What is the value of m and what is the value of b ? What do these numbers tell you about the graph?
3. How can you tell by looking at the graph of a line if the slope is negative or positive?
4. (a) What does a line of the form $y = \text{constant}$ look like, and what is its slope?
(b) What does a line of the form $x = \text{constant}$ look like, and what is its slope?
5. Construct a systematic series of steps to finding the lowest common denominator (LCD) of two or more fractions.
6. Do you need a LCD when you multiply a pair of fractions? Do you need an LCD when you add a pair of fractions?
7. Each of the equations at right can be solved for y in two steps. **Without actually solving** the equations, describe those steps
(a) $35 + 2y = 42$
(b) $2x + 3y = 15$
(c) $ax + by = c$

PRACTICE PROBLEMS

1. (Lesson 27)
 - (a) What is the LCD of $\frac{2b}{9ac^2}$ and $\frac{7a}{24bc}$?
 - (b) Find the numerator which will produce an equivalent fraction:
$$\frac{7}{n+1} = \frac{?}{(n+1)(n+3)}.$$

2. (Lesson 28) Add or subtract as indicated, and express your answers in simplest form.

(a) $\frac{8}{ab^3} + \frac{3}{a^2b}$

(b) $\frac{x+4}{2} - \frac{3x+1}{7}$

3. (Lesson 29) Solve each rational equation.

(a) $\frac{79-x}{x} = 5 + \frac{7}{x}$

(b) $0 = \frac{t}{3} - \frac{12}{t}$

(c) $x + \frac{7}{x} = -8$

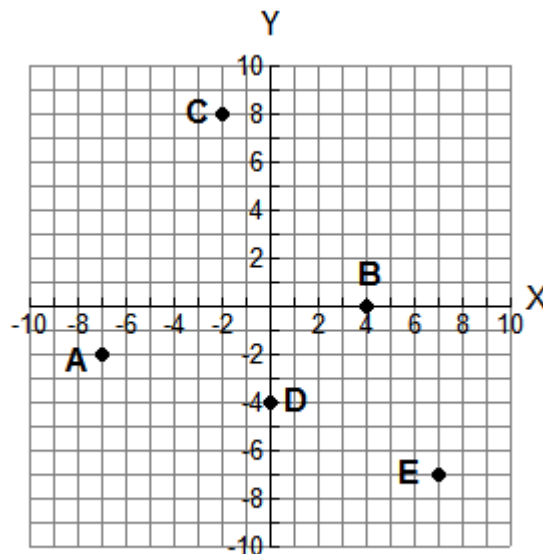
4. (Lesson 30)

(a) Solve for b : $A = \frac{1}{2}bh$

(b) Solve for a : $A = \frac{a+b}{2}$

(c) Find the value of m if $5S = 3m - k$, $S = 6$ and $k = 18$

5. (Lesson 32) State the coordinates of the points A, B, C, D, and E.



6. (Lesson 33) Determine which of the ordered pairs listed is a solution to the equation $4x - y = 3$:

(a) (0,3)

(b) (1,1)

(c) (-1,-7)

(d) (-3,0)

7. (Lesson 34) Graph each line. Label at least two points on each graph.

(a) $2x - y - 7 = 0$

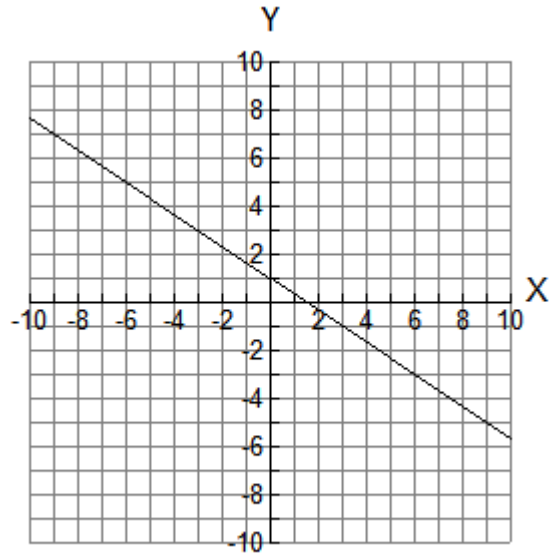
(b) $y + 3 = 0$

(c) $x - 5 = 0$

(d) $2x - 3y = 6$

8. (Lesson 35)

- (a) What is the slope of the line that contains the points $(-3,1)$ and $(7,-5)$?
- (b) Find the slope of the line on the right.



9. (Lesson 36) Given the line $3x + 2y - 10 = 0$,

- (a) What is the slope?
- (b) What is the y-intercept?
- (b) Sketch the graph of $3x + 2y - 10 = 0$.

10. (Lesson 37) Graph the line that passes through the point $(-3,1)$ and has a slope of -2 .

ANSWERS to the study questions

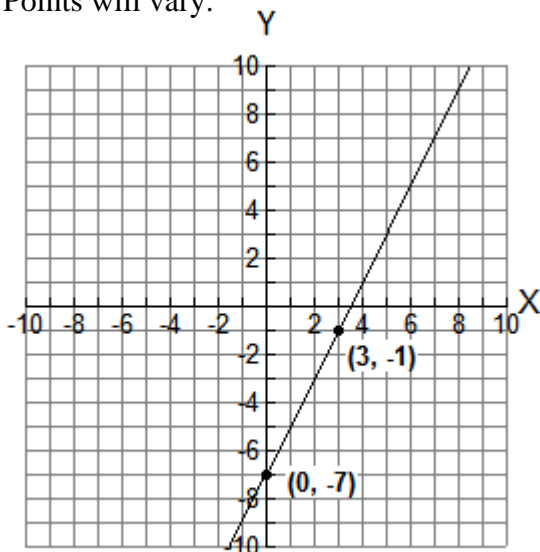
1. Substitute $x = 4$ and $y = -3$ into the equation $2x - y = 11$. Do left and right sides of this equation have the same value? If so, then $(4, -3)$ is a solution of the equation and is therefore a point on the graph of $2x - y = 11$.
2. (a) The graph will be a straight line.
(b) $y = \frac{5}{2}x - 5$
(c) $m = \frac{5}{2}$, which is the slope of the line. $b = -5$, and this is the y-intercept.
3. Lines with positive slope **rise** as you read them from left to right; lines with negative slope **fall** left-to-right.
4. (a) $y = \text{constant}$ is the equation of a horizontal line, and the slope is zero.
(b) $x = \text{constant}$ is the equation of a vertical line, and the slope is undefined.

5. (1) Factor each denominator into its prime factors.
 (2) Write the factors in exponential form. For example, if one denominator is $8x^4 + 8x^2$, write it as $2^3 x^2 (x^2 + 1)$.
 (3) The LCD is the product of all the prime factors, each raised to the highest power that appears in any one of the original denominators. For example, the LCD of fractions with denominators $2^3 xy^2$ and $2 \cdot 3x^5 y$ is $2^3 \cdot 3 \cdot x^5 \cdot y^2$ or $24x^5 y^2$.
6. A LCD is necessary only when adding or subtracting fractions and not when multiplying.
7. The method for all three is essentially the same: First, isolate the y-term on the left by subtracting the other term. Second, divide by the coefficient of y.

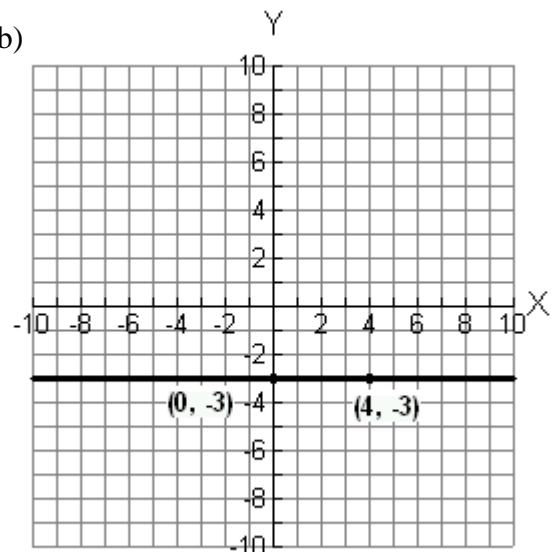
ANSWERS for practice exercises

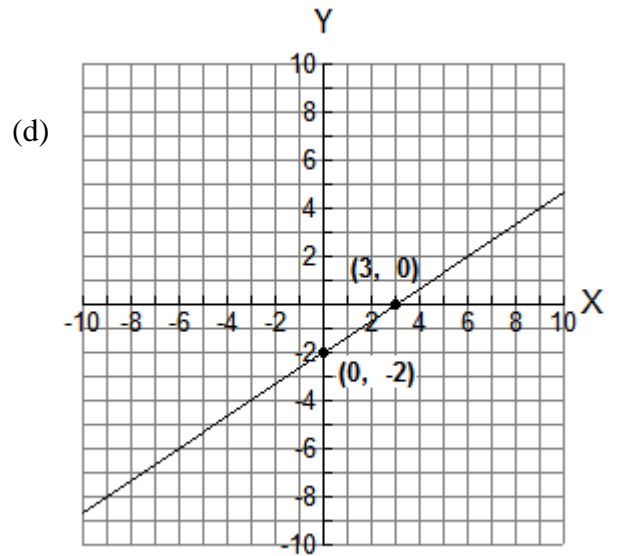
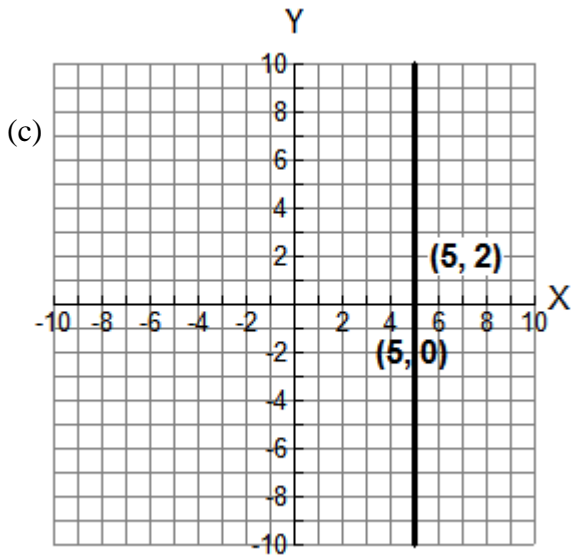
1. (a) $72abc^2$ (b) $7n + 21$
2. (a) $\frac{8a + 3b^2}{a^2 b^3}$ (b) $\frac{x + 26}{14}$
3. (a) $x = 12$ (b) $t = -6, 6$ (c) $x = -7, -1$
4. (a) $b = \frac{2A}{h}$ (b) $a = 2A - b$ (c) $m = 16$
5. A (-7,-2) B (4,0) C (-2,8) D (0,-4) E (7,-7)
6. b and c
7. Points will vary.

(a)



(b)





8. (a) $-\frac{3}{5}$ (b) $-\frac{2}{3}$

9. (a) $-\frac{3}{2}$ (b) 5

