

Final Exam Review

Topic Checklist

Chapter 3: Solve Linear Equations

□ Can you solve one, two and multi-step equations? (3.1-3.3)

Ex: a) $4 - x = -9$
 $x = 13$

b) $\frac{2}{9}x = -4$
 $x = -18$

c) $4(x - 3) + 3 = 11$
 $x = 5$

□ Can you solve equations with variables on both sides and interpret answers appropriately? (3.4)

Ex: a) $2(x + 6) = 3(x + 4)$
 $x = 0$

b) $4(x - 5) = 2(x + 3)$
 $x = 13$

c) $6(3x + 6) = 9(2x + 4)$
all real numbers

d) $4(3x + 4) = 6(2x + 5)$
no solution

□ Can you set up and solve proportions? (3.5-3.6)

Ex: $\frac{2}{2x+1} = \frac{4}{6x+1}$
 $x = 1/2$

□ Can you solve percent problems? (3.7)

Ex: 30 is 45% of what number?
 $66\frac{2}{3}$

□ Can you rewrite equations in function form? (3.8)?

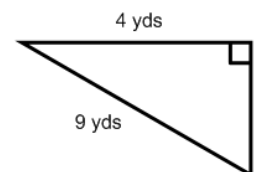
Ex: $4x - 5y = 20$
 $y = \frac{4}{5}x - 4$

□ Can you solve literal equations? (3.8) (ACC only)

Ex: $P = 2l + 2w$, solve for l
 $l = \frac{P-2w}{2}$

□ Can you solve problems involving the Pythagorean Theorem, including a) finding missing lengths or b) deciding if three sides can form a right triangle? (11.4)

Ex: a) $\sqrt{65}$ or 8.06



b) 13, 12, 5 yes

□ Can you perform operations with radicals? (11.2)

Ex: a) $3\sqrt{32}$ $12\sqrt{2}$

b) $\sqrt{\frac{24}{7}}$ $\frac{2\sqrt{42}}{7}$

c) $2\sqrt{7} + 3\sqrt{63}$ $11\sqrt{7}$

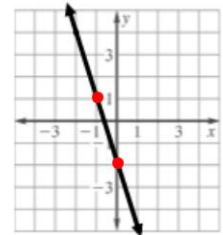
d) $\sqrt{3}(2 + \sqrt{12})$ $6 + 2\sqrt{3}$

e) $(\sqrt{7} + \sqrt{2})(\sqrt{7} - 3\sqrt{2})$
 $1 - 2\sqrt{14}$

□ Can you find the slope of a graphed line? (4.4)

-3

Ex:



□ Can you find the slope of a line given two points? Including identifying different types of slopes (i.e. positive, negative, zero or undefined)? (4.4)

Ex: a) $(20, 5), (10, 1)$ $\frac{2}{5}$

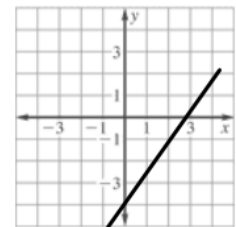
b) $(-3, 2), (-3, 7)$
undefined

c) $(4, 5), (8, 5)$ **0**

□ Can you identify x and y intercepts given a graph? (4.3)

y-intercept is -4
x-intercept is 3

Ex:

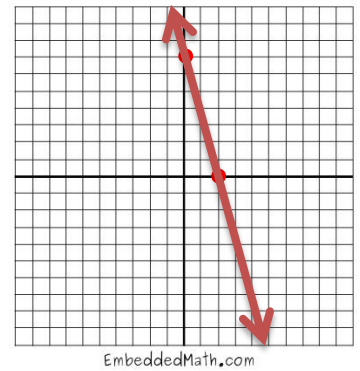


□ Can you find x and y intercepts given an equation? (4.3)

Ex: $2x - 5y = -10$
y-intercept is 2
x-intercept is -5

□ Can you graph using x and y intercepts? (4.3)

Ex: Graph $7x + 2y = 14$

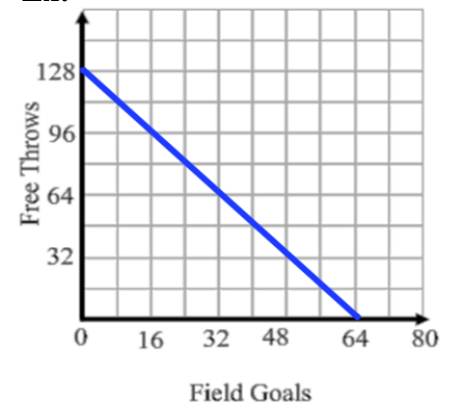


□ Can you identify possible combinations of a real-world situation given a graph? (4.3)

Field Goals **Free Throws**

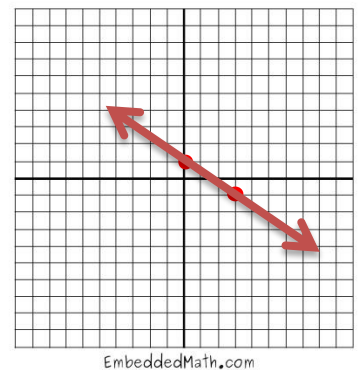
0	128
8	112
16	96
24	80
32	64
40	48
48	32
56	16
64	0

Ex:



□ Can you graph a line using slope-intercept form? (4.5)

Ex: Graph $y = -\frac{2}{3}x + 1$



□ Can you evaluate functions using function notation? (4.7)

Ex: a) If $f(x) = 2x - 3$,
evaluate when $x = 4$ $f(4) = 5$

b) Find x when $f(x) = 6$ (use
the same function above)

$x = 4.5$

□ Can you write equations in slope-intercept form? (5.1-5.2)

Ex: a) $m = 7$ $b = -3$ $y = 7x - 3$

b) Passes through $(0, 5)$ and $m = 4$

$$y = 4x + 5$$

c) $(6, 3)$ slope: -2

$$y = -2x + 15$$

d) $(-2, 5)$ $(2, -1)$

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

□ Can you write equations in slope-intercept form of parallel and perpendicular lines? (5.5)

Ex: passes through $(-3, -5)$ \parallel to $y = 3x - 1$

$$y = 3x + 4$$

Ex: passes through $(4, -2)$ \perp $y - 4x = 2$

$$y = -\frac{1}{4}x - 1$$

□ Can you decide if two lines are parallel or perpendicular given their equations? (5.5)

Ex: Line A: $y = -3x + 1$

Line B: $-x + 3y = 1$

Line C: $2x - 6y = 4$

B and C are Parallel. Line A is perpendicular to B and C

□ Can you write equations in standard form with a variety of information. (5.6)

Ex: a) passes through $(2, 2)$ $(4, -2)$

$$2x + y = 6$$

b) $Ax + 3y = 2$, passes through $(-1, 0)$

$$2x - 3y = -2$$

□ Can you solve and graph inequalities on a number line? (6.1-6.3)

Ex: Solve and graph:

$$-2x + 1 \geq 5$$

$$x \leq -2$$



□ Can you identify if an inequality has “no solution” or “all real numbers?” (6.3)

Ex: a) $3(2x - 4) > 6x + 8$

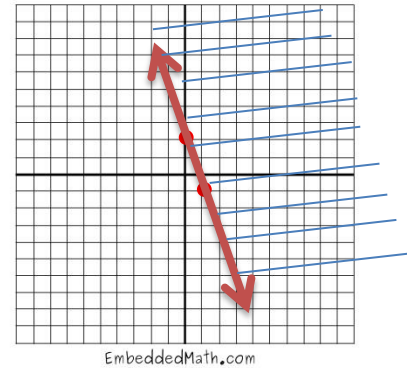
No Solution

b) $4(4x - 9) \leq 8(2x - 2)$

All Real Numbers

□ Can you graph inequalities in the coordinate plane and identify solutions? (6.7)

Ex: Graph: $y > -3x + 2$



□ Can you decide if an ordered pair is a solution to a linear system? (7.1)

Ex: Is $(-3, 1)$ a solution to:
 $x + y = -2$
 $x + 5y = 2$
yes

□ Can you solve a system of equations by graphing? (7.1)

Ex: $-x + y = -7$
 $x + 4y = -8$
 $(4, -3)$

□ Can you solve a system of equations by substitution? (7.2)

Ex: $4x + 6y = 4$
 $x - 2y = -6$
 $(-2, 2)$

□ Can you solve a system of equations by elimination a variable? (7.3-7.4)

Ex: a) $4x + 3y = 2$
 $5x + 3y = -2$
 $(-4, 6)$

b) $6x + 5y = 19$
 $2x + 3y = 5$
 $(4, -1)$

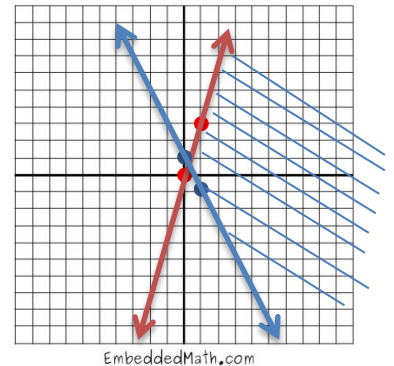
□ Can you decide if a system of equations has “one solution,” “no solution,” or “infinitely many solutions.” (7.5)

Ex: a) $3x + 2y = 10$
 $3x + 2y = 2$
No Solution

b) $y = 2x - 4$
 $-6x + 3y = -12$
Infinite Solutions

□ Can you graph a system of inequalities in the coordinate plane and identify solutions? (7.6)

Ex: $y < 3x$
 $y \geq -2x + 1$



□ Can you simplify expressions involving positive, negative and zero exponents? (8.1-8.3)

Ex: a) $\frac{(2x)^{-2}y^5}{-4x^2y^2} \frac{y^3}{-16x^4}$

b) $\frac{4x^{-2}y^4}{8xy^6} \frac{1}{2x^3y^2}$

c) $(3x^{-2}y^2)^3 \frac{27y^6}{x^6}$

□ Can you write expressions in scientific notation? (8.4)

Ex: 267,500,000
 2.675×10^8

□ Can you multiply and divide expressions in scientific notation? (8.4)

Ex:
 a) $(5.7 \times 10^3)(2.6 \times 10^4)$
 1.482×10^8
 b) $\frac{1.2 \times 10^4}{1.6 \times 10^{-3}} 7.5 \times 10^6$

□ Can you add/subtract/multiply polynomials? (9.1-9.3)

Ex:
 a) $(2x^3 - 5x^2 + x) + (2x^2 + x^3 - 1)$
 $3x^3 - 3x^2 + x - 1$
 b) $(4x^2 - 3x + 5) - (3x^2 - x - 8)$
 $x^2 - 2x + 13$
 c) $(4n - 1)(n + 5)$
 $4n^2 + 19n - 5$

□ Can you factor and solve polynomials using the GCF? (9.4)

Ex: a) $14y^2 + 21y$
 $7y(2y + 3)$
 b) $3x^2 + 18x = 0$
 $3x(x + 6) = 0$
 $x = 0 \quad x = -6$

□ Can you factor and solve quadratics when $a = 1$? (9.5)

Ex: a) $x^2 + 11x + 18$
 $(x + 2)(x + 9)$
b) $n^2 - 6n + 8$
 $(n - 4)(n - 2)$
c) $w^2 + 6w - 16 = 0$
 $(w + 8)(w - 2) = 0$
 $w = -8 \quad w = 2$

□ Can you factor and solve quadratics when a is not 1? (9.6)

Ex: a) $2x^2 - 7x + 3$
 $(2x - 1)(x - 3)$
b) $3n^2 + 14n - 5 = 0$
 $(3n - 1)(n + 5)$
 $n = \frac{1}{3} \quad n = -5$

ACC only - c) $-4x^2 + 12x + 7$
 $-(2x + 1)(2x - 7)$

□ Can you factor the difference of two squares? (9.7)


Ex: a) $25m^2 - 16$
 $(5m + 4)(5m - 4)$
b) $12 - 48m^2 = 0$
 $3(2 + 4m)(2 - 4m) = 0$
 $m = -\frac{1}{2} \quad m = \frac{1}{2}$

Accelerated only:

□ Can you factor a 4-term polynomial? (9.8)

Ex: $x^3 + 3x^2 + 5x + 15$
 $(x^2 + 5)(x + 3)$

□ Can you sketch a quadratic equation based on its characteristics? (10.1)

Ex: $y = -5x^2 + 1$


□ Can you graph a quadratic equation by finding its axis of symmetry and vertex? (10.2)

Ex: $y = 3x^2 - 6x + 2$
vertex $(1, -1)$
Axis of symmetry $x = 1$

□ Can you identify the maximum and minimum of a quadratic equation? (10.2)

Ex: $y = -3x^2 - 12x + 10$
Maximum 22

□ Can you solve a quadratic equation by graphing? (10.3)

Ex: $x^2 - 2x = 3$
 $x = -1 \quad x = 3$

□ Can you solve a quadratic equation by using the square roots method? (10.4)

Ex: a) $2p^2 - 7 = 2$
 $p = 2.12 \quad p = -2.12$
b) $3(t + 5)^2 = 24$
 $t = -2.2 \quad t = -7.8$

□ Can you solve a quadratic equation by using the quadratic formula? (10.6)

Ex: $3x^2 + 5x - 8 = 0$
 $x = 1 \quad x = -2\frac{2}{3}$

□ Can you identify the number of solutions to a quadratic equation *without solving*? (10.7)

Ex: $3x^2 + 8x + 7 = 0$
No Solution