Core 40 End-of-Course Assessment Algebra I Reference Sheet

Pythagorean Theorem

$a^2 + b^2 = c^2$

Distance Formula

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

d = distance between points 1 and 2

Midpoint Formula

$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

M = point halfway between points 1 and 2

Standard Form of a Linear Equation

$Ax + By = C$

(where A and B are not both zero)

Standard Form of a Quadratic Equation

$ax^2 + bx + c = 0$

(where $a \neq 0$)

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

(where $ax^2 + bx + c = 0$ and $a \neq 0$)

Equation of a Line

Slope-Intercept Form: $y = mx + b$
where m = slope and b = y-intercept
Point-Slope Form:
$y - y_1 = m(x - x_1)$

Simple Interest Formula

$I = prt$
where I = interest
p = principal
r = rate
t = time

Slope of a Line

Let (x_1, y_1) and (x_2, y_2) be two points in the plane.

$$\text{slope} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$

(where $x_2 \neq x_1$)

Shape		Formulas for Area (A) and Circumference (C)	
Triangle		$A = \frac{1}{2}bh = \frac{1}{2} \times$ base $\times$ height	
Trapezoid		$A = \frac{1}{2}(b_1 + b_2)h = \frac{1}{2} \times$ sum of bases $\times$ height	
Parallelogram		$A = bh$ = base $\times$ height	
Circle		$A = \pi r^2 = \pi \times$ square of radius $C = 2\pi r = 2 \times \pi \times$ radius	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Figure		**Formulas for Volume (V) and Surface Area (SA)**	
Cube		$SA = 6s^2 = 6 \times$ length of side squared	
Cylinder (total)		$SA = 2\pi rh + 2\pi r^2$ $SA = 2 \times \pi \times$ radius $\times$ height $+ 2 \times \pi \times$ radius squared	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Sphere		$SA = 4\pi r^2 = 4 \times \pi \times$ radius squared $V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times$ radius cubed	
Cone		$V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \pi \times$ radius squared $\times$ height	
Pyramid		$V = \frac{1}{3}Bh = \frac{1}{3} \times$ area of base $\times$ height	
Prism		$V = Bh$ = area of base $\times$ height	

ECA PRACTICE TEST
(Review Problems)

1. Solve $\frac{3x+2}{2} = \frac{3x-12}{6}$

A. $x = 1$
B. $x = -1$
C. $x = -3$
D. $x = -6$

2. Solve the linear inequality $3x - 16 > 5x + 12$

A. $x > -12$
B. $x > -14$
C. $x < -7$
D. $x < -14$

3. Given the equation $\frac{2a-3b}{c} = 5$, solve for a.

A. $a = \frac{2+b}{15c}$ **B.** $a = \frac{5c+3b}{2}$

C. $b = \frac{2a-5c}{3}$ **D.** $c = \frac{2a-3b}{5}$

4. You are selling candy bars for $0.85 a piece and you need to raise at least $135. Write an inequality that shows how many candy bars (C) you need to sell.

5. Line l passes through points (-6, 1) and (-3, 6). Line m is parallel to line l and passes through point (15, -1). What is the equation of line m?

6. Graph $x - 3y = 6$.

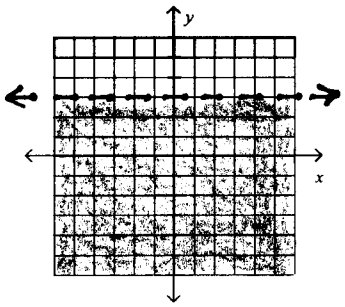
7. Graph $3y \leq 2x - 6$

8. Solve the following system:

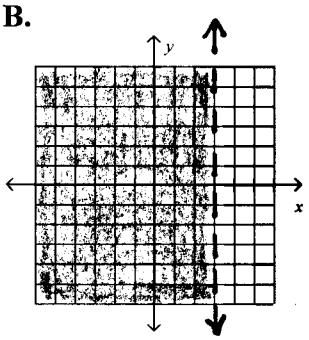
$6x + 2y = 8$
$x - y = -7$

9. Which graph represents $x < 3$?

A.



B.



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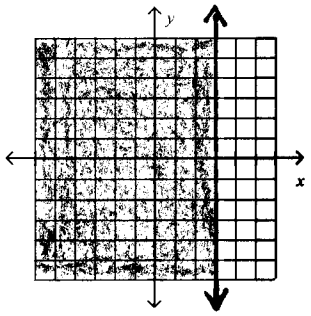
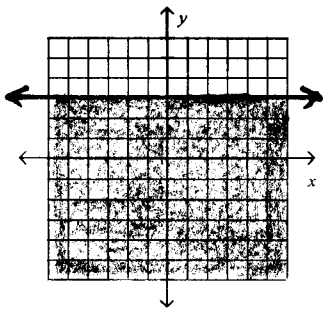


D.



10. Andrea is going to the grocery store to buy apples and lemons. 13 apples and 15 lemons will cost her \$10.44. 3 apples and 7 lemons will cost her \$2.94. What is the price of an apple?

11. Graph the following system of linear inequalities:

$$y \leq -\frac{1}{3}x + 1$$

$$y > \frac{5}{3}x + 2$$

12. Factor $18x^2 - 32$

13. Factor $3x^2 - 11x + 6$

14. Solve $x^2 - 4x - 12 = 0$

A. $x = -2, 2$

B. $x = -12, 1$

C. $x = -2, 6$

D. $x = -5, 7$

15. Solve $x^2 + 2x = 1$

16. What are the zeros of $f(x) = x^2 + 12x + 27$?

17. Solve $\sqrt{-3x+18} = x$

18. Devin is practicing golf at the driving range. The equation that represents the height of his ball is $-0.5t^2 + 12t = s$ where s is the number of feet and t is the number of seconds. If the ball is at 31.5 ft in the air, how many seconds have gone by?

A. 5 seconds
B. 3 seconds
C. 21 seconds
D. 3 seconds or 21 seconds

19. Is $y = x^2 - 5$ a function?

A. Yes, because it passes the vertical line test
B. Yes, because it passes the horizontal line test
C. No, because it fails the horizontal line test
D. No, because it fails the vertical line test

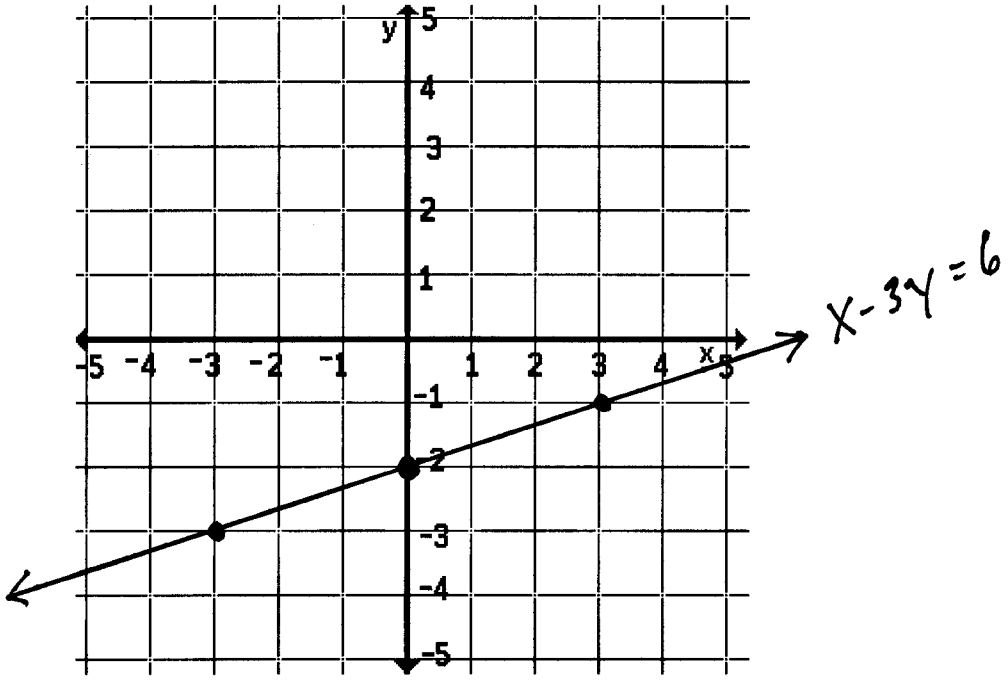
20. Graph $y = x^2 - 4x + 4$

ANSWERS

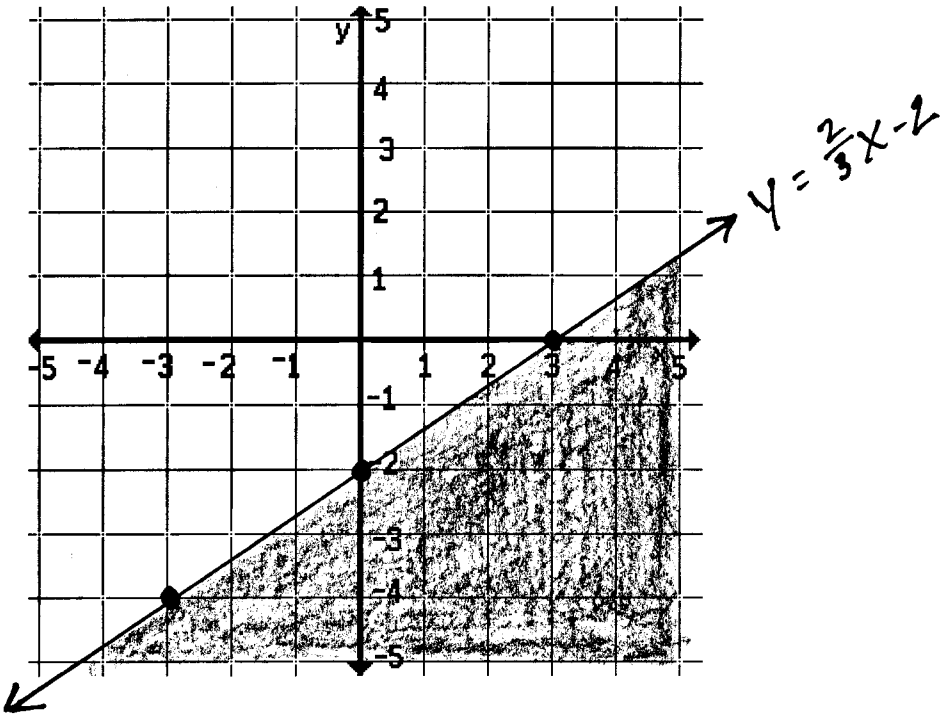
1. C **2.** D **3.** B

4. $.85C \geq 135.00$ **5.** $y = \frac{5}{3}x - 26$

6.

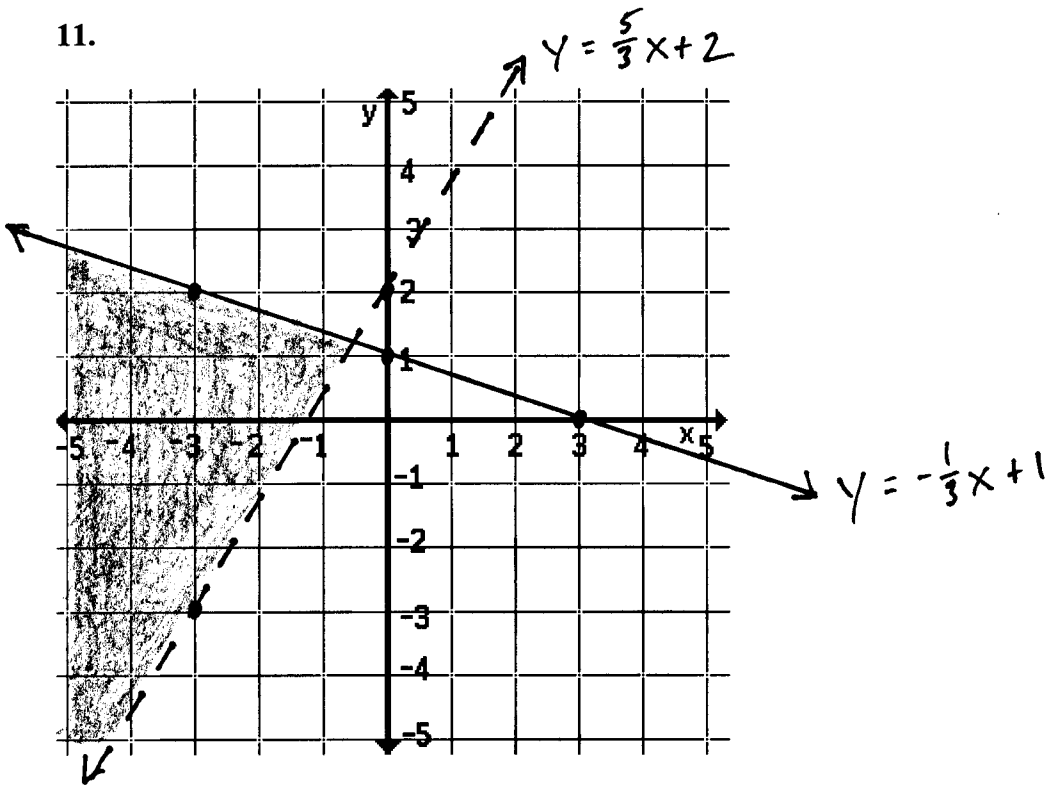


7.



8. $(-\frac{3}{4}, \frac{25}{4})$ **9.** B **10.** \$0.63

11.



12. $2(3x - 4)(3x + 4)$ **13.** $(3x - 2)(x - 3)$ **14.** C **15.** $x = -1 \pm \sqrt{2}$

16. -9 and -3 **17.** $x = -6, 3$ **18.** D **19.** A

20.