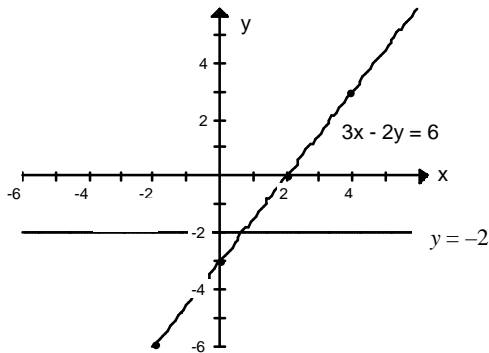


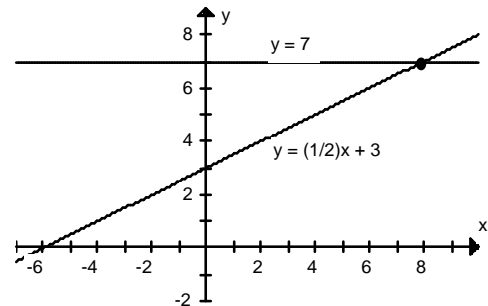
## Answers to Math 95 Review Sheets Problems

- 1)  $z = 25/7$
- 2) a)  $y = \frac{3x-8}{2}$  or  $y = \frac{3}{2}x - 4$     b)  $x = \frac{7}{r-11}$
- 3) The value of the loom after 5 years is \$1470.
- 4) a) Let  $x$  be the original price.  
Equation:  $(x + 0.40x) - 0.40(x + 0.40x) = 220$ .  
Answer: The original price was \$261.90.
- Let  $r$  be the single discount rate.  
Equation:  $261.90 - 261.90r = 220$ .  
Answer:  $r = 0.16$  or 16%
- b) Answer: The selling price should be \$95,000.
- 5) ai) 18 ft.    aii) 20 sq. ft    aiii) 40 cubic ft    aiv) 76 sq. ft.
- b) The area of the triangle is 84 sq. in; perimeter 42 in.
- c) Area, approx. 157 sq. cm; Perimeter, approx. 51 cm
- 6) a) For line A:  $x$ -int (10, 0),  $y$ -int (0, 15)
- b)  $x$ -int is (2, 0);  $y$ -int is (0, -3). c) See graph below.

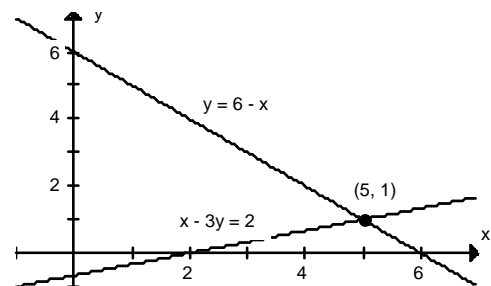


- 7) a) Slope is  $2/5$ .
- b) Line A:  $-3/2$ , Line B: undefined
- c) Slope is 0
- 8) undefined
- 
- 9)  $y = -(2/3)x + 6$ ; slope  $-2/3$ ,  $y$ -int (0, 6)

- 10) a) One pair has same slope 4; other pair has slope  $-1$ . Slopes 4 and  $-1$  are not negative reciprocals.
- b) Slope of first is  $3/2$ , the second  $-2/3$ . They are negative reciprocals so the lines are perpendicular.
- 11) a) The equation of this vertical line is  $x = -25$ .
- b) A line whose equation is  $y = -2$  is shown above in 6).
- 12) a)  $y - 5 = -\frac{1}{5}(x - 2)$ ,  $y = -\frac{1}{5}x + \frac{27}{5}$
- b)  $y = -\frac{1}{2}x - \frac{5}{2}$
- 13) a) No. For 15 rides, the cost is less without the pass.  
b) The difference is \$5.  
c) For 20 rides, the cost will be the same.  
d) The cost of the pass is \$20.
- 14) ai) Slope is 1 dollar per ride.  
aii) The cost per ride is \$1 for a person with a pass.  
aiii) The vertical intercept indicates the pass costs \$20.
- b) The vertical intercept is 1549 thousand which says there were 1,549,000 nurses in 1985. The slope is 34 thousand per year which says the number of nurses is increasing at a rate of 34,000 per year.
- 15) (8, 2) No; (2, 0) No; (5, 1) Yes
- 16) a) The solution is  $x = 8$ ,  $y = 7$ , as shown.



- b) Solution is  $x = 5$ ,  $y = 1$ , as shown.



- 17) a) The solution is  $x = 2$ ,  $y = -3$ .
- b) The solution is  $x = -1$ ,  $y = -3$ .
- 18) a) Let  $x$  = dollar amount invested in stocks and  $y$  = dollar amount in bonds. The system is

$$\begin{aligned}x + y &= 20000 \\ 0.15x + 0.108y &= 2496\end{aligned}$$

Answer: \$8,000 in stocks, \$12,000 in bonds

b) 20 gallons of the 30% solution should be mixed with 40 gallons of the 60% solution.

- 19) a)  $9x^4y^{10}$     b)  $\frac{5x^7}{16y^5}$     c)  $\frac{b^6}{3a^{11}}$
- 20) 1
- 21) a)  $-12x^4 - 4x^3 + x^2 + 9x - 6$ ; degree 4; leading coefficient  $-12$ .  
b) One possibility is  $5x^6 + 7x^2 - 9$ .
- 22) a)  $22x^3 - 14x^2 - 4x + 8$   
b)  $12x^3 + 4x^2 + 12x - 14$
- 23) a)  $-10x^5 + 16x^4 - 14x^3 + 6x^2$   
b)  $x^3 + 125$   
c)  $35x^2 + 16x - 3$   
d)  $4x^2 - 9$
- 24) a)  $1 + \frac{4}{x}$     b)  $2x^4 - x + \frac{1}{3x}$
- 25) a)  $ab(2a - 5b + 7ab)$   
b)  $(x - 3)(7 + y)$   
c)  $-3x(x - 9)$
- 26) a)  $(x - 3)(x^2 + 4)$   
b)  $(3x - 2)(4x + 1)$
- 27) a)  $(2x - 5)(3x + 7)$   
b)  $5w(3w - 2)(w - 1)$
- 28)  $(6x - 7y)(6x + 7y)$
- 29) a)  $(x - 2y)(x^2 + 2xy + 4y^2)$   
b)  $(5b + 4)(25b^2 - 20b + 16)$
- 30) a)  $x = 5/2$  or  $x = -7/3$   
b)  $x = 5/3$   
c)  $x = 0$  or  $x = 4$
- 31) a)  $3x^2 - x + 5 = 0$     b) 2; 3    c) 5    d) 3, -1, 5
- 32) The fraction is not defined if  $x = 1$  or if  $x = -1$ .
- 33) a)  $\frac{3}{a + 3}$     b)  $-1/2$

- 34) a)  $\frac{5(x+1)}{3}$     b) 4
- 35) a) 2    b)  $-\frac{1}{2(t-4)}$     c)  $\frac{3x-5}{x(x-5)}$

36)  $\frac{x+4}{x^3}$

- 37) a)  $x = 1/4$     b)  $x = 0$  or  $x = 4$

38) About 1053 units should be produced.  
The average cost cannot be \$4.00 per unit. (Try substituting  $C = 4$  and solve for  $x$ . What happens?)

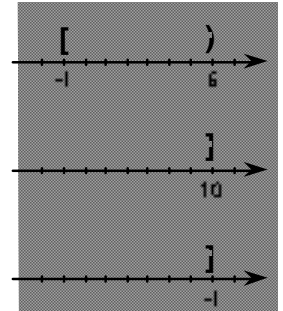
- 39) a)  $h(0) = -1$ ,  $h(-4) = 19$ ,  $h(c) = 2c^2 + 3c - 1$ ,  
 $h(5r) = 50r^2 + 15r - 1$

b)

$F$	-13	4	32	212	451
$g(F)$	-25	-15.6	0	100	232.8

40)

- a)  $[-1, 6)$



- b)  $x \leq 10$ ;  $(-\infty, 10]$

- 41) a)  $x \leq -1$

- b)  $x < 18/5$  or  $x < 3.6$ ,  $(-\infty, 18/5)$

- 42) a)  $\square 2$     b)  $\square -1/4$

- 43) a)  $\square 4.729$     b)  $\square 34.238$ ,  $\square$  rounded to 3 places  $\square$

- 44) a)  $\square \square L^{2/5} m^{4/5}$     b)  $\sqrt[3]{(8x)^2}$  or  $\square \square \square (\sqrt[3]{8x})^2$

- 45) ai)  $\square 6$     aii)  $\square 25$     aiii)  $\square 27$     b)  $14y^{7/12}$

- 46) a)  $\square 2x^2y^2\sqrt{11y}$   $\square$      $\square \square \square 4x^6\sqrt{2x}$

- 47) a)  $\square 3x$     b)  $\square \square \frac{x^2\sqrt{2x}}{3}$

- 48) a)  $\frac{\sqrt{2}}{2}$   $\square$     b)  $\frac{\sqrt{30}}{6}$   $\square \square$

- 49)  $-2\sqrt{3}$   $\square$

- 50) a)  $\square 10\sqrt{3} + 2\sqrt{6}$   $\square$     b)  $\sqrt{6} + \sqrt{10} + \sqrt{21} + \sqrt{35}$   $\square \square$   
 $\square \square \square \square \square$

- 51) a)  $\square x \square = 9$     b)  $\square x \square = 3$  or  $x = -1$

c)  $x = -2$  or  $x = -4$

52) The speed was approximately 30 mph.

53)  $3i\sqrt{5}$

54) a)  $x = \pm\sqrt{8}$  or  $\pm 2\sqrt{2}$

b)  $y = \frac{1 \pm 4}{3}$ , thus  $y = 5/3$  or  $y = -1$

55) a)  $x = \pm 4i$       b)  $x = \frac{3 \pm 2i}{2}$  or  $\frac{3}{2} \pm i$

56)  $(x+3)^2 = 14$ , thus  $x = -3 \pm \sqrt{14}$

57)  $\sqrt{101}$

58) a) Discriminant is 44; there will be two real solutions.  
b) Discriminant is -76; there will be two imaginary solutions.

59) a)  $x = \frac{-6 \pm \sqrt{44}}{-4}$  which when simplified,  $x = \frac{3 \pm \sqrt{11}}{2}$

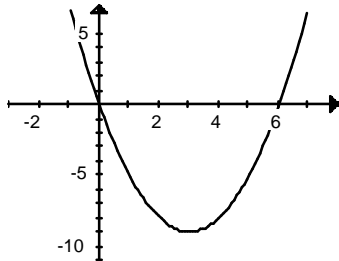
b)  $t = -3 + 2i$  or  $t = -3 - 2i$

60) a)  $x = 3$  or  $x = 9$       b)  $x = 4 \pm \sqrt{5}$

61) a) The dimensions are  $10\sqrt{5}$  by  $20\sqrt{5}$ , or approximately 22.4 feet by 44.7 feet.

b) The base is 16.3 inches; the height is 12.3 inches.

62)



63) The solutions are the x-intercepts of the graph,  $x \approx -1.5$  and  $x \approx 3.5$ .

64) a) parabola    b) symmetry    c) (1, -6)    d) minimum

65) a) Opens upward      b) Opens downward

66) y-int (0, -5); x-intercepts: (1.35, 0) and (-1.85, 0)

67)  $x = 1$  is the equation of the axis of symmetry. The vertex is located at (1, -9).

68) a)

Axis of sym.

$x = 1$

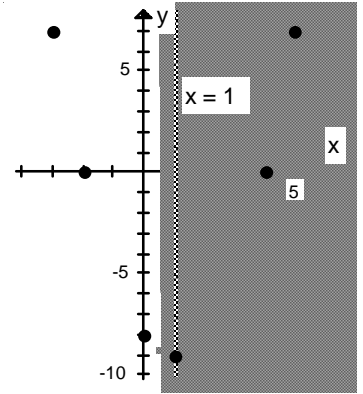
vertex (1, -9)

y-int is (0, -8)

x-ints (-2, 0), (4, 0)

Additional pts

(-3, 7), (5, 7)



b)

$y = 3x^2 - 8x + 4$

Axis of sym.

$x = 4/3$

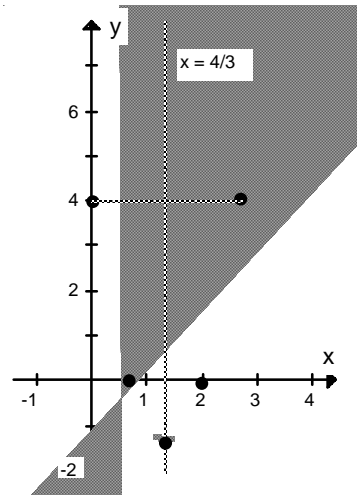
vertex (4/3, -4/3)

y-int (0, 4)

x-ints (2/3, 0), (2, 0)

Additional point

(8/3, 4) sym. to y-int.



69) The parabola opens upward and therefore has a minimum point at the vertex, (3, -32).

70) a) The maximum height was 105 feet.

b) It took 2.5 seconds to reach that height.

c) It hits the ground 5 seconds after launch.

d) When  $t = 0$ ,  $h = 5$ . So the y-int is 5 feet and this is the height of the platform.

71)  $f(-1) = 5/2$ ,  $f(3) = 40$

72) a) The account giving 5.6% compounded semiannually will grow to \$7908.28; 5.3% monthly yields \$7816.02. Thus, the first is better by \$98.26.

b) For continuous compounding, the balance will be \$7820.58, for a total interest of \$1820.58.

c) There were approximately 1200 people in 1970. In 2010, 40 years later, the predicted population is about 2260.

73) a)  $2^6 = 64$       b)  $10^B = A$       c)  $e^{3.5} = x$

d)  $\log_3 81 = 4$  and  $x = \ln 100$

e)  $\log_5 125 = 3$  because 3 is the exponent on 5 to get 125

f) The exponent on 2 is 1.7 because  $2^{1.7} = T$ .

74) 0.3522; 2.3522; 1.9544; 6.5596;  $\log(-40)$  does not exist