MAP 280 (T2) Issue 4
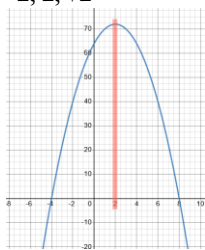
Answer Key

1. a) 3, -5, 5
    b) -5, 5; 0
    c) U, 0, -75
    d) 1, 0, -75

2. a) -1, -4, 6
    b) -4, 6; 1
    c) D, 1, 25
    d) -1, 1, 25
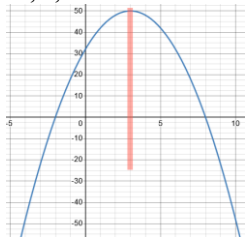
3. a) -2, -4, 8
    b) -4, 8; 2
    c) D, 2, 72
    d) -2, 2, 72
    e)

4. a) 2, -3, 7
    b) -3, 7; 2
    c) U, 2, -50
    d) 2, 2, -50

5. a) -2, -2, 8
    b) -2, 8; 3
    c) D, 3, 50
    d) -2, 3, 50
    e)

6. Yes

7. First, use B to write $\frac{3-(\ \ )}{-1-(\ \ )}$
    Then, use A to fill $\frac{3-(7)}{-1-(-5)}$
    Finally, simplify it as $\frac{-4}{4} = -1$

8. First, use D to write $\frac{10-(\ \ )}{7-(\ \ )}$
    Then, use C to fill $\frac{10-(-5)}{7-(1)}$
    Finally, simplify it as $\frac{15}{6} = \frac{5}{2} = 5/2$

9. $\Delta y = Q_y - P_y = (3) - (4) = -1$
    $\Delta x = Q_x - P_x = (2) - (-3) = 5$
    slope $= \Delta y/\Delta x = -\frac{1}{5} = -1/5$

10. $\Delta y = S_y - R_y = (5) - (-2.5) = 7.5$
    $\Delta x = S_x - R_x = (-6.5) - (-9) = 2.5$
    slope $= \Delta y/\Delta x = 3$

11. 1/7

12. -3/4

13. 4/3

14. $\Delta y = B_y - A_y = (1) - (3) = -2$
    $\Delta x = B_x - A_x = (-3) - (0) = -3$
    slope(AB) $= \Delta y/\Delta x = -2/-3 = 2/3$

15. $\Delta y = C_y - B_y = (-3) - (1) = -4$
    $\Delta x = C_x - B_x = (-2) - (-3) = 1$
    slope(BC) $= \Delta y/\Delta x = -4/1 = -4$

16. (0, 1)

17. (-1, 1)

18. (13/3, -14/3)

19. (11/7, 2/7)

20. (-2/9, 8/9)

21. $2\sqrt{6}$

22. $2\sqrt{14}$

23. $6\sqrt{11}$

24. $6\sqrt{10}$

25. $12\sqrt{2}$

26. 8000

27. 8

28. 64

29. 10

30. 100

31. 40

32. 64000

33. 50

34. 125000

35. 20

36. 15

37. 52

38. 119

39. 300

40. $2\sqrt{13}$

41. $3\sqrt{17}$

42. $5\sqrt{2}$

43. $7\sqrt{26}$

44. $12\sqrt{29}$

45. $0.5\sqrt{41}$

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46. $36\times\frac{5}{7+5} = 15$ (Alex)

    $36\times\frac{7}{7+5} = 21$ (Brian)

47. Let x: the measure of the angle, 90-x: the complement, and 180-x: the supplement

    $\frac{1}{4}(90\text{-}x) + \frac{1}{5}(180\text{-}x) = 36$

    $5(90\text{-}x) + 4(180\text{-}x) = 720$

    $1170 - 9x = 720$

    $9x = 450$

    $x = 50°$

48. $5\times\frac{1}{2} = 2.5$ mi (Kirk was ahead)

    $7 - 5 = 2$ mi per hour (Nancy was faster)

    $2.5\div2 = 1.25$ hr = 1 hr 15 min

49. 2 hr 6 min = 2.1 hr

    $7\times\frac{12}{2.1} = \frac{12}{0.3} = 40$ letters

50. Method I:

#pennies	#nickels	difference
5	5	20¢
6	4	14¢
7	**3**	**8¢**

    Method II:
    Assume there are equal number of pennies and nickels. The difference of values is
    $5(5 - 1) = 20$.
    However, the actual difference is only 8¢. The slack is
    $20 - 8 = 12$¢.
    We need to exchange some nickels with pennies. Each exchange will make a difference $5 + 1 = 6$¢ in value. How many times do we need to exchange?
    $12 \div 6 = 2$ (times)
    Therefore, there are
    $5 + 2 = 7$ (pennies) and
    $5 - 2 = 3$ (nickels).

51. Let one family pick p peaches, and the other pick $4p$ peaches.

    $p+4p = 240$

    $5p = 240$

    $p = 48$

52. $(120\text{-}2x)(90\text{-}2x) = \frac{1}{2}(120)(90)$

    By factoring 2 out, we reduce the problem.

    $4(60\text{-}x)(45\text{-}x) = \frac{1}{2}120\cdot90$

    Cancel 4 out from both sides:

    $(60\text{-}x)(45\text{-}x) = 1350$

    $x^2\text{-}105x+1350 = 0$

    $(x\text{-}90)(x\text{-}15) = 0$

    $x = 15$ ft (90 not desired, why?)

53. $1 + 20\% = 1.2$

    $36\div1.2 = \$30.00$

54. $1 - 20\% = 0.8$

    $0.80\times\$30 = \$24.00$

55. $36 - 24 = \$12.00$

56. Let Pete be x years old, so Bob be $x+10$. In 3 years, Pete will be $x+3$ and Bob will be $x+13$.

    Bob = 2·Peter

    $x+13=2(x+3)$

    $x+13 = 2x + 6$

    $x = 7$ (Pete)

    $x + 10 = 17$ (Bob)

57. 1 mpm (mark per minute)
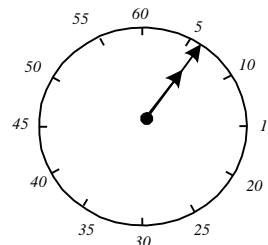
58. $\frac{1}{12}$ mpm (mark per minute)

59. $\frac{1}{12}$:1 = 1:12

60. It is 12:00 when the two hands meet for the first time after 11:00, therefore, they won't meet between 11 and 12.

    When the hour hand points to 1, the minute hand points to 12, therefore, the minute hand cannot catch up with the hour hand between 12 and 1.

61. The two hands cannot meet between 12 and 1. (Why?) The first time they meet must be slightly passing 1. Therefore, let's think of starting from 1:00 A.M., that is, the hour hand is 5 marks ahead.
    Method I)
    Let x be the number of marks from 1:00 that the hour hand is going to meet with the minute hand. Then, the minute hand moves $12x$ marks.

    Note that the minute hand must have traveled one full round to meet with the minute hand:

    $12x = 5 + x$

    $x = \frac{5}{11}$

    Method II)
    The relative speed between the two hands is $(1 - \frac{1}{12}) = \frac{11}{12}$ mark per minute. The distance is 5 marks.

    The time (number of minutes) $= \frac{5}{1-\frac{1}{12}} = \frac{60}{11} = 5\frac{5}{11}$ (min).

    Both methods reach the same conclusion that they will meet at $1:5\frac{5}{11}$A.M..

62. $2:10\frac{10}{11}$A.M.

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