Middlesex County College
MAT 014 Algebra II
Final Exam Review

1. Solve: $\frac{3}{16}t - \frac{1}{4} = \frac{1}{28}$

A) No solution **B)** $t = \frac{10}{21}$ **C)** $t = \frac{1}{3}$ **D)** $t = \frac{32}{21}$

2. Solve: $3 = 2(8w - 5) - (8 + w)$

A) $w = \frac{11}{5}$ **B)** $w = \frac{16}{17}$ **C)** $w = \frac{7}{5}$ **D)** $w = \frac{21}{17}$

3. Solve: $9(9y + 4) - 4 = 2y - 4 + 79y + 28$

A) No solution **B)** $y =$ any real # **C)** $y = 0$ **D)** None of the above

4. A farmer plants soybeans and corn on his 660 acres of land. He plants twice as many acres with soybeans as with corn. How many acres are planted with corn?

A) 220 acres **B)** 440 acres **C)** 330 acres **D)** 660 acres

5. How many gallons of gasoline that 12% ethanol must be added to 2,000 gallons of gasoline with no ethanol to get a mixture that is 10% ethanol?

A) 10,000 gallons **B)** 1,800 gallons **C)** 11,115 gallons **D)** 20,000 gallons

6. The sum of two consecutive even integers is 158. What is the smaller of the two integers?

A) –78 **B)** 80 **C)** 78 **D)** 156

7. Solve for y: $5x - 6y = 4$

A) $y = -5x - \frac{2}{3}$ **B)** $y = \frac{5}{6}x + 4$ **C)** $y = -\frac{5}{6}x + \frac{2}{3}$ **D)** $y = \frac{5}{6}x - \frac{2}{3}$

8. Solve for h: $A = kr(h + r)$

A) $h = \dfrac{A - kr^2}{kr}$ **B)** $h = \dfrac{A - kr}{r}$ **C)** $h = \dfrac{A - r}{kr}$ **D)** $h = A - kr - r$

9. Write in interval notation: $x \le \dfrac{13}{2}$

A) $\left[\dfrac{13}{2}, \infty\right)$ **B)** $\left(-\infty, \dfrac{13}{2}\right)$ **C)** $\left(-\infty, \dfrac{13}{2}\right]$ **D)** $\left(\dfrac{13}{2}, \infty\right)$

10. Solve and write the solution in interval notation: $2 + 6z < 5z + 14$

A) $(-\infty, 12)$ **B)** $(-\infty, 12]$ **C)** $(12, \infty)$ **D)** $(-\infty, 16)$

11. Solve: $|-5x + 4| - 12 = -4$

A) No solution **B)** $x = -\dfrac{4}{5}, x = -\dfrac{12}{5}$ **C)** $x = -\dfrac{4}{5}$ **D)** $x = -\dfrac{4}{5}, x = \dfrac{12}{5}$

12. Solve and write the solution in interval notation: $|4w - 7| \ge 5$

A) $\left(-\infty, \dfrac{1}{2}\right] \cup [3, \infty)$ **B)** $\left[\dfrac{1}{2}, 3\right]$ **C)** $\left[-3, -\dfrac{1}{2}\right]$ **D)** $(-\infty, -3] \cup \left[-\dfrac{1}{2}, \infty\right)$

13. Determine the slope of the line containing the points $(1, -11)$ and $(-7, -8)$

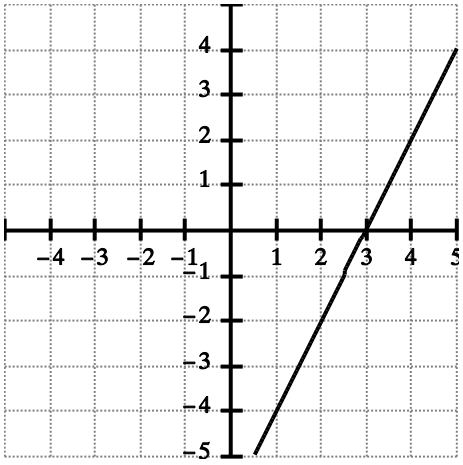
A) $m = -\dfrac{8}{3}$ **B)** $m = -\dfrac{3}{8}$ **C)** $m = \dfrac{8}{3}$ **D)** $m = \dfrac{3}{8}$

14. Write the slope-intercept form of the equation of the line that passes through $(-10, -14)$ and $(15, 6)$

A) $y = \dfrac{5}{4}x - \dfrac{51}{4}$ **B)** $y = \dfrac{4}{5}x - 6$ **C)** $y = -\dfrac{4}{5}x + 18$ **D)** $y = \dfrac{5}{4}x - \dfrac{3}{2}$

15. Graph the linear equation: $x = 2y + 3$

A)



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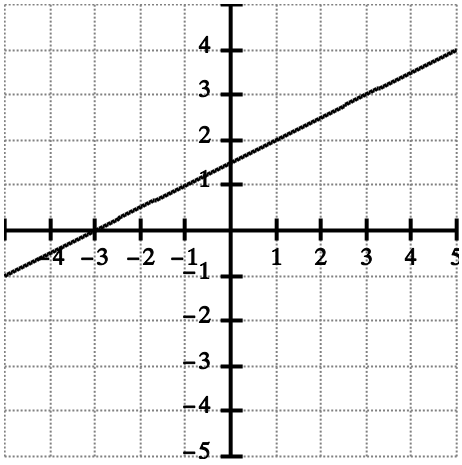

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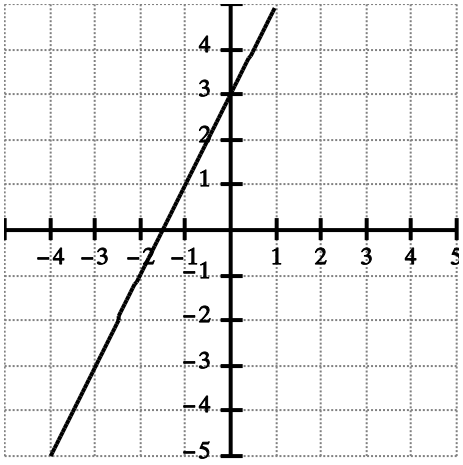

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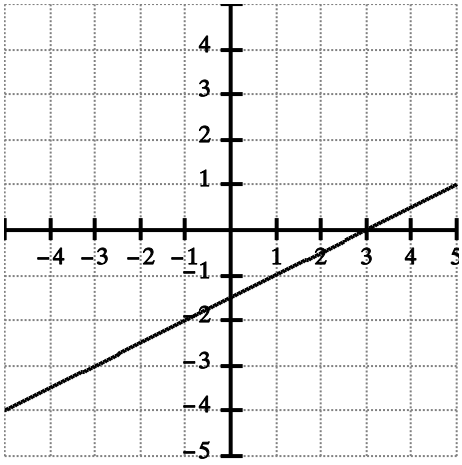


16. Write the equation of the horizontal line that passes through $(4, -2)$

A) $x + 2 = 0$ **B)** $y = -2$ **C)** $x = 4$ **D)** $y - 4 = 0$

17. Determine whether the lines are parallel, perpendicular, or neither:

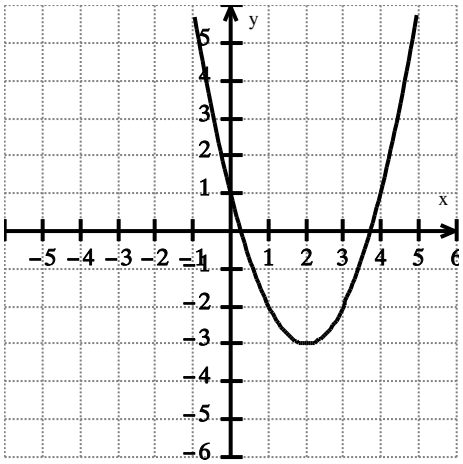
$-8x - 9y = 3$

$-\frac{3}{2}x + \frac{4}{3}y = 5$

A) parallel **B)** perpendicular **C)** neither

18. Determine which of the following graphs is NOT a function:

A)



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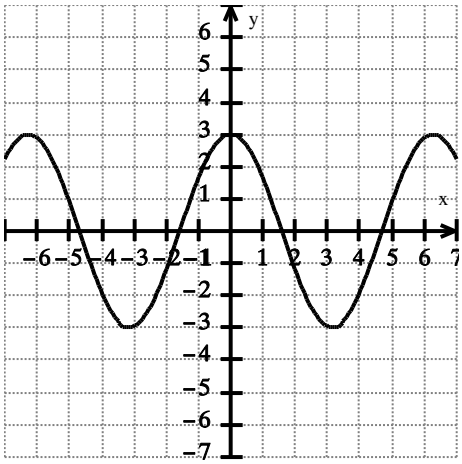
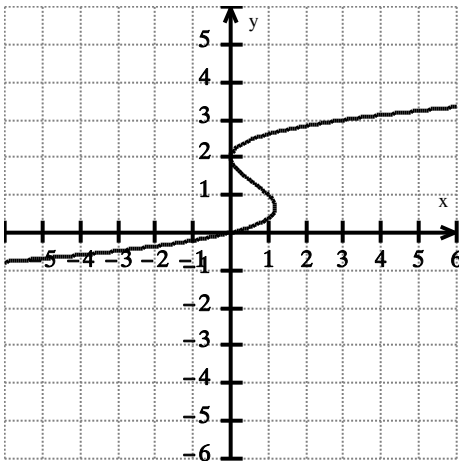
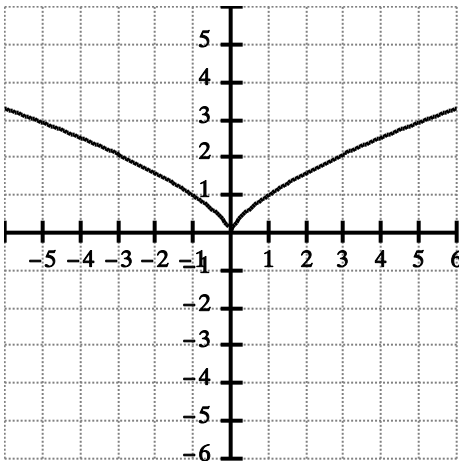


C)



D)



19. Identify the domain and range of the relation, and determine whether or not the relation is a function.

$\{(-4,-11),(-1,-6),(1,-1),(3,17)\}$

A) Domain: $\{-4,-1,1,3\}$; Range: $\{-11,-6,-1,17\}$; Function

B) Domain: $\{-11,-6,-1,17\}$; Range: $\{-4,-1,1,3\}$; Function

C) Domain: $\{-4,-1,1,3\}$; Range: $\{-11,-6,-1,17\}$; Not a function

D) Domain: $\{-11,-6,-1,17\}$; Range: $\{-4,-1,1,3\}$; Not a function

20. Determine the domain: $f(x)=\dfrac{3x+2}{x^2+8x-9}$

A) $(-\infty,-9)\cup(-9,1)\cup(1,\infty)$ **B)** $(-\infty,\infty)$

C) $\left(-\infty,-\dfrac{2}{3}\right)\cup\left(-\dfrac{2}{3},\infty\right)$ **D)** $(-\infty,-1)\cup(-1,9)\cup(9,\infty)$

21. Determine the domain: $h(t)=\sqrt{4-7t}$

A) $\left[\dfrac{4}{7},\infty\right)$ **B)** $\left[\dfrac{7}{4},\infty\right)$ **C)** $\left(-\infty,\dfrac{4}{7}\right]$ **D)** $\left(-\infty,\dfrac{7}{4}\right]$

22. Let $g(x)=2x-4$ and evaluate $g\left(\dfrac{1}{3}\right)$

A) -6 **B)** $-\dfrac{10}{3}$ **C)** -10 **D)** $-\dfrac{2}{3}$

23. Let $f(x)=4x^2+6x-5$ and simplify $f(2+x)$

A) $4x^2+22x+23$ **B)** $23+x$ **C)** $4x^2+6x-7$ **D)** $4x^2+2x+23$

24. Solve the system: $\begin{cases}8y+2x=50\\x=-4y+27\end{cases}$

A) Infinitely many solutions **B)** No solution

C) $(6,1)$ **D)** $(1,6)$

25. The Bulldogs won 7 more baseball games than the Eagles. Determine how many games the Bulldogs won if both teams together won 31 games.

A) 24 games **B)** 19 games **C)** 26 games **D)** 12 games

26. Simplify: $\left(\frac{2c^{-1}d^5}{5c^4d^3}\right)^{-2}$. The answer should not contain negative exponents.

A) $\frac{25c^6}{4d^4}$ **B)** $\frac{25c^{10}}{4d^4}$ **C)** $-\frac{4d^4}{25c^{10}}$ **D)** $\frac{4c^{10}}{25d^4}$

27. Simplify: $\left(3s^{-4}t^4\right)^4\left(2s^{-7}t^6\right)$. The answer should not contain negative exponents.

A) $\frac{162t^{22}}{s^{23}}$ **B)** $\frac{6t^{22}}{s^{11}}$ **C)** $\frac{6t^{14}}{s^{11}}$ **D)** $\frac{24t^{22}}{s^{23}}$

28. Which of the following is a degree 4 trinomial?

A) $6x^3-x^2-4x+9$ **B)** $-2x^3+7x+18$ **C)** $4x^2+12x+9$ **D)** x^4+5x^2-24

29. Simplify: $\left(-2x^4+6x^3-5x\right)+\left(-5x^4-9x^2+6x\right)$

A) $-7x^4+6x^3-9x^2-11x$ **B)** $-2x^4-10x^3-9x^2+x$

C) $-7x^4+6x^3-9x^2+x$ **D)** $-7x^4+6x^3-14x^2+6x$

30. Simplify: $\left(9n^2+7\right)+\left(-n^2+5\right)-\left(-3n^2-3\right)$

A) $11n^2+9$ **B)** $13n^2+5$ **C)** $11n^2+15$ **D)** $5n^2+9$

31. Multiply: $-2s^7\left(3s^5-4s^4+3s-5\right)$

A) $-6s^{35}+8s^{28}-6s^8+10s^7$ **B)** $-6s^{12}+8s^{11}-6s^8+10s^7$

C) $-6s^{12}-8s^{11}+6s^8-10s^7$ **D)** $-6s^{12}-4s^4+3s-5$

32. Multiply: $(8x+9)(4x-3)$

A) $32x^2+12x-27$ **B)** $12x-27$ **C)** $32x^2-27$ **D)** $32x^2-36x-12$

33. Multiply: $(9z+5)(z^2-3z+2)$

A) $9z^3-22z^2+3z+10$ **B)** $10z^2-27z+10$

C) $9z^3-27z^2+18z+10$ **D)** $9z^3-15z^2+2$

34. Multiply: $(p+6)^2$

A) p^2+12 **B)** p^2+36 **C)** $p^2+6p+36$ **D)** $p^2+12p+36$

35. Divide: $\dfrac{6x^4-15x^3-9x^2+9x}{3x}$

A) $2x^3-5x^2-3x+3$ **B)** $6x^4-14x^2+9x$ **C)** $-13x^3-9x^2+9x$ **D)** $6x^4-15x^3-9x^2+3$

36. Divide: $\dfrac{8r^3-14r^2+2r+40}{4r+5}$

A) $-12r^2+2r+8$ **B)** $\dfrac{8r^3-14r^2+10}{5}$ **C)** $\dfrac{-12r^2+2r+8}{2}$ **D)** $2r^2-6r+8$

37. Divide: $(x^4+7x^3-5x^2+x-11)\div(x-1)$

A) $x^3+8x^2+3x+\dfrac{4x-7}{x-1}$ **B)** x^3+8x^2+3x+4

C) $x^3+6x^2-11x+12-\dfrac{23}{x+1}$ **D)** $x^3+8x^2+3x+4-\dfrac{7}{x-1}$

38. Factor completely: $5n^2+90n+400$

A) $5(n+8)(n+10)$ **B)** $5(n^2+18n+80)$ **C)** prime **D)** $(n+10)(5n+40)$

39. Factor completely: $4c^4 + 20c^3 + 12c^2 + 60c$

A) $4\left(c^2+3\right)\left(c^2+5c\right)$ **B)** $4c\left(c^2+3\right)(c+5)$ **C)** $\left(4c^2+12\right)\left(c^2+5c\right)$ **D)** $4c\left(c^2+5\right)(c+3)$

40. Factor completely: $5w^2 - 13w - 28$

A) $w(5w-13)-28$ **B)** $(5w+7)(w-4)$ **C)** $(5w+7)(w+4)$ **D)** prime

41. Factor completely: $4p^2 - 49$

A) $(2p+7)(2p-7)$ **B)** $(4p+7)(p-7)$ **C)** prime **D)** $(2p-7)^2$

42. Factor completely: $m^2 - 4mn - 60n^2$

A) $(m-6n)(m-10n)$ **B)** $(m-6n)(m+10n)$ **C)** prime **D)** $(m+6n)(m-10n)$

43. Solve: $t^2 - 17t = -72$

A) $t=-9, t=-8$ **B)** $t=9, t=8$ **C)** $t=0, t=-17$ **D)** $t=0, t=17$

44. Solve: $z = 6z^2$

A) $z=-\frac{1}{6}$ **B)** $z=\frac{1}{6}$ **C)** $z=0, z=\frac{1}{6}$ **D)** $z=0, z=-\frac{1}{6}$

45. A rectangular garden is to cover 288 square feet of area. If the width is 2 feet less than the length, find the dimension of the pen.

A) length = 18ft; width = 16ft **B)** length = 36ft; width = 8ft

C) length = 20ft; width = 18ft **D)** length = 19ft; width = 17ft

46. Simplify: $\dfrac{x^2-7x-30}{7x^2-70x}$

A) $\dfrac{x-3}{7x}$ **B)** $\dfrac{x+3}{7x}$ **C)** cannot be simplified **D)** $\dfrac{4}{7}$

47. Multiply: $\dfrac{2x^2-2x-12}{x+3}$ g $\dfrac{x^2-9}{2x^2+4x}$

A) $\dfrac{(x-3)(x+3)}{x(2x+3)}$ **B)** $\dfrac{(x-3)(x-3)}{x}$ **C)** $\dfrac{(x-3)(x-3)}{x(x+3)}$ **D)** $\dfrac{2(x+2)(x-3)}{(x+4)}$

48. Divide: $\dfrac{\left(\dfrac{8x^8y^2}{49}\right)}{\left(\dfrac{12x^3y^5}{7}\right)}$

A) $\dfrac{2x^5y^3}{1029}$ **B)** $\dfrac{56x^8y^2}{588x^3y^5}$ **C)** $\dfrac{2x^5}{21y^3}$ **D)** $\dfrac{96x^{11}y^7}{343}$

49. Subtract: $\dfrac{x}{x+2} - \dfrac{3-x^2}{x^2-4}$

A) $\dfrac{2x^2-2x-3}{x^2-4}$ **B)** $\dfrac{x^3+2x-3}{(x^2-4)(x+2)}$ **C)** $\dfrac{x^2+x-3}{-x^2+x+6}$ **D)** $\dfrac{-2x-3}{x^2-4}$

50. Solve: $\dfrac{4}{y+4} + \dfrac{26}{y^2-16} = \dfrac{10}{y-4}$

A) $y=\dfrac{25}{7}$ **B)** $y=5$ **C)** No solution **D)** $y=-5$

51. Solve: $\frac{6}{x^2-7x+12} + \frac{2x}{x-3} = \frac{3x}{x-4}$

A) $x=6$ **B)** $x=-2, x=3$ **C)** $x=-2$ **D)** $x=3, x=4$

52. Convert the expression to radical form and simplify, if possible: $(-64)^{1/3}$

A) $-\frac{1}{4}$ **B)** –4 **C)** 4 **D)** $-\frac{64}{3}$

53. Convert the expression to radical form and simplify, if possible: $100^{3/2}$

A) 1010 **B)** 1000 **C)** 150 **D)** not a real number

54. Multiply and simplify: $\sqrt{20} \cdot \sqrt{y}$

A) $20\sqrt{y}$ **B)** $\sqrt{20y}$ **C)** $2\sqrt{5y}$ **D)** $5\sqrt{4y}$

55. Simplify: $\sqrt[3]{72}$

A) $2\sqrt[3]{9}$ **B)** $6\sqrt{2}$ **C)** $6\sqrt[3]{2}$ **D)** $8\sqrt[3]{9}$

56. Simplify: $\sqrt{50m^{26}}$. Assume the variable represents a positive real number.

A) $5\sqrt{2m^{26}}$ **B)** $m^{13}\sqrt{50}$ **C)** $m^{24}\sqrt{50}$ **D)** $5m^{13}\sqrt{2}$

57. Simplify: $\sqrt[3]{64a^{14}b^{18}}$

A) $4a^3b^5 \cdot \sqrt[3]{a^5b^3}$ **B)** $4a^4b^6 \cdot \sqrt[3]{a^2}$ **C)** $61a^{11}b^{15}$ **D)** $8a^7b^9$

58. Simplify: $7\sqrt{2} + \sqrt{98} - 3\sqrt{50}$

A) $-19\sqrt{2}$ **B)** $-\sqrt{2}$ **C)** $90\sqrt{2}$ **D)** $20\sqrt{2}$

59. Multiply and simplify: $\left(\sqrt{2}+6\right)\left(5\sqrt{2}-4\right)$

A) $-4+26\sqrt{2}$ **B)** $5\sqrt{4}-26\sqrt{2}-24$ **C)** $26\sqrt{2}-14$ **D)** $34\sqrt{2}-14$

60. Rationalize the denominator: $\dfrac{-14}{\sqrt[3]{3}}$

A) $\dfrac{3\sqrt[3]{9}}{-14}$ **B)** $\dfrac{-14\sqrt[3]{3}}{3}$ **C)** $\dfrac{-14\sqrt[3]{9}}{3}$ **D)** Already rationalized

61. Rational the denominator: $\dfrac{3}{9-\sqrt{5}}$

A) $\dfrac{27+3\sqrt{5}}{56}$ **B)** $\dfrac{3\sqrt{5}}{4}$ **C)** $\dfrac{27+3\sqrt{5}}{76}$ **D)** $\dfrac{3}{9+\sqrt{5}}$

62. Solve: $\sqrt{p-6}-8=1$

A) $p=71$ **B)** No solution **C)** $p=55$ **D)** $p=87$

63. Solve: $\sqrt[3]{5t-23}+7=5$

A) $t=\dfrac{\sqrt[3]{-2}+23}{5}$ **B)** $t=3$ **C)** No solution **D)** $t=\dfrac{31}{5}$

64. Solve: $z-1=\sqrt{57-z}$

A) $z=-7, z=8$ **B)** No solution **C)** $z=-7$ **D)** $z=8$

65. Simplify the radical in terms of i: $\sqrt{-8}$

A) $4i\sqrt{2}$ **B)** $-2i\sqrt{2}$ **C)** $2i\sqrt{2}$ **D)** $2\sqrt{2i}$

66. Simplify: $13i-\left(-3-4i\right)+\left(-4+5i\right)$

A) $12+9i$ **B)** $-7+14i$ **C)** $6+i$ **D)** $-1+22i$

67. Multiply and simplify: $\left(-5-4i\right)\left(4+6i\right)$

A) $-44-46i$ **B)** $4-46i$ **C)** $-20-46i-24i^2$ **D)** $-20-46i+24i^2$

68. Divide: $\dfrac{3-i}{2+i}$

A) $-\dfrac{3}{2}$ **B)** $\dfrac{3}{2}-i$ **C)** $1-i$ **D)** $\dfrac{5}{4}-\dfrac{5}{4}i$

69. Simplify: i^{15}

A) $-i$ **B)** 1 **C)** i **D)** -1

70. Solve: $84=5p^2-13p$

A) $p=84, p=\dfrac{97}{5}$ **B)** $p=-3, p=\dfrac{28}{5}$ **C)** $p=\dfrac{13}{10}\pm\dfrac{\sqrt{1511}}{10}i$ **D)** None of the above

71. Solve: $\left(m+12\right)^2+20=69$

A) $m=5, m=19$ **B)** $m=-5, m=-19$ **C)** $m=12\pm7i$ **D)** $m=-12\pm7i$

72. Determine the value of n so that the expression is a perfect square trinomial: x^2+8x+n

A) $n=4$ **B)** $n=64$ **C)** $n=16$ **D)** $n=8$

73. Solve: $y^2+25=8y$

A) $y=4\pm3i$ **B)** $y=8\pm i\sqrt{39}$ **C)** $y=8\pm\sqrt{39}$ **D)** $y=-4\pm3i$

74. An object is launched from the ground. The height h (in feet) of the object t seconds after the object is released is given by $h = -16t^2 + 96t$. When will the object be 80 feet in the air?

A) at 1 second

B) at 1 second & 5 seconds

C) at 3 seconds

D) at 5 seconds