SELF TEST

Self Diagnostic Test

Is your high school background strong, adequate or weak?
To find out you may take this test at home (a closed book style).
For each of the statements given answer (T) for True and (F) for False.
If the statement is false, write a correction to the left hand side. If no correction is possible, say so (there are only five of them!)

All variables used: $x, y, a, b, c, \cdots$, are assumed to be arbitrary permissible real numbers.

Give yourself one point for correctly answering T or F, and another point for writing a correction when applicable. If a statement is true or no correction is possible, you automatically earn a point! The total points that can be earned is $(90)(2) = 180$.

Here is the assessment criterion:

1. If you scored 144 points or higher, you have a strong background.
2. If you scored 108 or more but less than 144 points, you have an adequate background and you need a little bit of review in the areas of your weakness.
3. If you scored 72 or more but less than 108 points, you have a weak background.
4. If you scored below 72 points, your background is very weak. We will post review material for you on Blackboard.

The answers to the self test will be posted.
Please do not look at the answers before you have taken the test.
Good Luck to all from your AMAT 217 professors!

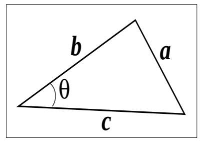
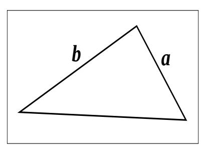
The statement	(T) or (F)	Correction (if False)
01. $(a+b)^2 = a^2 + b^2$		
02. $a^{-\frac{1}{2}} = \dfrac{1}{a^2}$		
03. $-(-2)^2 = 4$		
04. $-3^4 = 81$		
05. $2^3 = 6$		
06. $\dfrac{a+b}{c} = \dfrac{a}{c} + \dfrac{b}{c}$		
07. $\dfrac{0}{3}$ is not defined.		
08. $\dfrac{5h}{h(h+2)} = \dfrac{4h}{h+2}$		
09. $\dfrac{\frac{1}{2}}{3} = \dfrac{3}{2}$		
10. $\dfrac{xy}{2} = \dfrac{x}{2} \cdot \dfrac{y}{2}$		
11. $\dfrac{5}{0} = 0$		
12. $\left(\sqrt{x+1}\right)^2 = (x+1)^2$		
13. $\dfrac{1}{3x} + \dfrac{2}{7x} = \dfrac{3}{10x}$		
14. $\sqrt{a+b} = \sqrt{a} + \sqrt{b}$		

The statement	(T) or (F)	Correction (if False)
15. $\dfrac{c}{a+b} = \dfrac{c}{a} + \dfrac{c}{b}$		
16. $\sqrt{\sqrt{a}} = a$		
17. $\sqrt{64} = \pm 8$		
18. $\sqrt[4]{x^3} = x^{4/3}$		
19. $\sqrt{-1}$ is a real number		
20. $\sqrt[3]{x^2} = x^{2/3}$		
21. $\sqrt[5]{x^7} = \left(\sqrt[5]{x}\right)^7$		
22. $\dfrac{\sqrt{27}}{3} = \sqrt{9} = 3$		
23. $\sin(1) = 0.017452406$		
24. $\sqrt{x^2} = -x$ if $x < 0$		
25. $\lvert -x \rvert = \lvert x \rvert$		
26. $\left\lvert x^2 \right\rvert = -x^2 \quad \text{if} \quad x < 0$		
27. $\left(x^5\right)^4 = x^9$		
28. $x^9 x^4 = x^{36}$		

The statement	**(T)** or **(F)**	**Correction (if False)**
29. $(3x)^{-1} = \dfrac{1}{3x}$		
30. $3x^{-1} = \dfrac{1}{3x}$		
31. $\pi = 180°$		
32. $\dfrac{1}{a^{-3/4}} = a^{3/4}$		
33. $a^{x+y} = a^x + a^y$		
34. $x^3 + 1 = (x^2 + 1)(x + 1)$		
35. $\log(xy) = \log(x) \cdot \log(y)$		
36. $3^0 = 0$		
37. $\sqrt[5]{x^5} = \|x\|$		
38. $x^2 - 10x - 24 = (x - 6)(x - 4)$		
39. $x^2 - 10x + 24 = (x - 12)(x + 2)$		
40. $\log(-1)$ is a real number		
41. $2\log(x) = \log^2(x)$		
42. $x^2 + 1 = (x + 1)(x + 1)$		

The statement	(T) or (F)	Correction (if False)
43. $x^4 - 1 = (x-1)^4$		
44. If $x^3 = 2$, then $x = 2^3 = 8$		
45. If $\sqrt[3]{x} = 8$, then $x = \sqrt[3]{8} = 2$		
46. $\sqrt[3]{-x}$ is not defined for all $x \in \mathbb{R}$		
47. The slope of the straight line $3y = 5x - 2$ is 5		
48. The equation of the x-axis is $x = 0$		
49. The equation of the y-axis is $x = 0$		
50. $\sqrt{-x}$ is not defined for all $x \in \mathbb{R}$		
51. $-2x = 0 \implies x = 0$		
52. $-3x = 2 \implies x = 2 + 3 = 5$		
53. $x^2 + 1 = 0 \implies x = \pm 1$		
54. $(x-2)^2 = 0 \implies x = \pm 2$		
55. $\frac{3x}{2} = \frac{3}{2}x$		
56. $2\left(\frac{4}{3}\right) = \frac{8}{6}$		

The statement	(T) or (F)	Correction (if False)
57. $\dfrac{(x-1)(x-3)}{3-x} = x-1$		
58. $-x-1 = -(x-1)$		
59. $\sqrt{4x^2+9} = 2x+3$		
60. $\sin\big(\cos(x)\big) = \sin(x)\ \cos(x)$		
61. $\sin(2x) = 2\ \sin(x)$		
62. $\cos(-x) = -\cos(x)$		
63. $x^2 \cot\left(x^3\right) = \cot\left(x^5\right)$		
64. $\cos^3(x) = \cos\left(x^3\right)$		
65. If $\log_2(x) = 5$, then $x = 2^5$		
66. $\dfrac{2}{x} + \dfrac{5}{y} = \dfrac{2y+5x}{xy}$		
67. If $g(x) = x^2$, then $g(2+h) = 4+h$		
68. The solution set of the equation $x^2 - 2x = 0$ is $\{2\}$		
69. The solution set of the equation $\dfrac{x-1}{x+5} = 0$ is $\{1,\ 2\}$		
70. The conjugate of $\sqrt{x+1}-2$ is $\sqrt{x-1}+2$		

The statement	(T) or (F)	Correction (if False)
71. The slope of the line perpendicular to the line $2x - 3y + 11 = 0$ is $\dfrac{3}{2}$		
72. In the triangle  $\sin(\theta) = \dfrac{a}{c}$		
73. $y^2 = 3x + 1$ is an equation of a straight line with slope 3		
74. If $(2c + 5)(c - 1) = -3$ then either $2c + 5 = -3$, or $c - 1 = -3$. Hence either $c = -4$ or $c = -2$		
75. To factor $x^2 - 4$ proceed as follows: Let $x^2 - 4 = 0$, hence $x = \pm 2$.		
76. The area of the triangle  is $\dfrac{1}{2}ab$		
77. Two triangles are said to be similar if and only if they have the same area.		
78. Two triangles are said to be similar if and only if they have sides of the same length		
79. The centre of the circle $(x - 1)^2 + (y + 3)^2 = 5$ is the point $(-1, 3)$		
80. An isosceles triangle is a triangle in which all sides have the same length		

The statement	**(T)** or **(F)**	**Correction (if False)**
81. To solve the inequality $\frac{x-1}{x} > 0$, we proceed as follows: Multiply both sides by x to get $x-1>0$. Hence $x>1$ or $x \in (1, +\infty)$		
82. Two triangles are said to be similar if and only if their angles have the same measures.		
83. The pair of lines $2x+y-1=0$ and $2y+x-1=0$ are parallel.		
84. If $\sin(x) = \frac{3}{5}$ and x is an acute angle, then $\sec(x) = \frac{5}{3}$.		
85. The parallel lines $3x+2y-1=0$ and $6x+4y+17$ intersect at the point $(1,4)$.		
86. The line $2x+3y=12$ has an x-intercept equal to 6, and a y-intercept equal to 4. Therefore the straight line must pass through the point $(6,4)$.		
87. The equation $\sqrt[3]{x} = -1$ has no real number solutions.		
88. The inequality $-1 \geq x \geq 2$ has no solution.		
89. $\infty - \infty = 0$		
90. The radius of the circle $4x^2+4y^2=81$ is 9 units		