

## TEST 1 ANSWERS

1) c 2) a 3) c 4) a 5) b 6) c 7) b 8) c 9) b 10) b 11) a 12) a 13) b 14) a 15) c  
 16) c 17) b 18) a 19) b 20) c 21) b 22) c 23) a 24) b 25) c 26) c 27) b 28) b 29) b 30) c

## FULL SOLUTIONS BELOW

1.  $1/2 + 1/3 = 3/6 + 2/6 = 5/6$

2.  $\frac{1}{\sqrt{2}-1} = \frac{(\sqrt{2}+1)}{(\sqrt{2}+1)} \times \frac{1}{(\sqrt{2}-1)} = \frac{\sqrt{2}+1}{2-1} = \frac{\sqrt{2}+1}{1} = \sqrt{2}+1$

3.  $f(x) = x^3 - 3x^2 + 3$       $f(-1) = (-1)^3 - 3(-1)^2 + 3$       $f(-1) = -1$

4.  $x^2 - 7x + 10 = 0$       $x = ?$       $(x-2)(x-5) = 0$ , so  $x = 2$  and  $5$

5.  $\frac{1}{x-2} - \frac{1}{x+5} = \frac{(x+5)}{(x+5)} \times \frac{1}{x-2} - \frac{1}{x+5} \times \frac{(x-2)}{(x-2)} = \frac{x+5}{x^2+3x-10} - \frac{x-2}{x^2+3x-10}$   

$$\frac{(x-2)(x+5) - (x-2)(x-2)}{x^2+3x-10} = \frac{7}{x^2+3x-10}$$

6.  $|x-5| \leq 3$       $x-5+5 \leq 3+5$       $x \leq 8$       $x-5 \geq -3$       $x-5+5 \geq -3+5$       $x \geq 2$   
 $2 \leq x \leq 8$

7)  $5^x = 12$   
 B)  $\log_5 12$

8) The Radius of the circle is  $x^2+4x+y^2=5$

$$x^2+4x+4+y^2=5+4$$

$$x^2+4x+4+y^2=9$$

$$\sqrt{9} = 3$$

Radius is 3

9) pythagorus theorem tells us the hypotenuse is 5.  
 If  $\theta$  is in the third quadrant than  $\cos \theta$  B)  $-4/5$

10)  $7+2/3x = 3$

$$2/3x = 3 - 7$$

$$(3)2/3x = -4(3)$$

$$2x = -12$$

$$x = -6$$

11) The domain of  $f(x) = \sqrt{x-4}$  is

$$A) x \geq 4$$

$$12) \frac{(9 \cdot 27)^2}{3^8} = \frac{(3^2 \cdot 3^3)^2}{3^8}$$

$$\frac{(3^5)^2}{3^8} = \frac{3^{10}}{3^8} = 3^2 = 9$$

$$13. 30^\circ (\pi/180) = 30\pi/180 = \pi/6$$

14. Slope =  $-3/7$ , so the perpendicular slope is the reciprocal  
 $m = 7/3$

15.  $(\frac{x_2+x_1}{2}, \frac{y_2+y_1}{2})$  - insert the two given points to find midpoint

$$\begin{aligned} & \frac{(16+8)}{2}, \frac{(8+2)}{2} \\ & 24/2, 10/2 \\ & (12, 5) \end{aligned}$$

$$16. m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1-5}{2-4} = \frac{-4}{-2} = 2$$

$$y - y_1 = m(x - x_1)$$

$$y - 5 = 2(x - 4)$$

$$y = 2x - 8 + 5$$

$$y = 2x - 3$$

17.

$$y = (3x+1)^7 \text{ - take the seventh root of each side}$$

$$\sqrt[7]{y} = 3x+1 \text{ - subtract +1 from each side}$$

$$\sqrt[7]{y-1} = 3x \text{ - divide by 3}$$

$$\frac{\sqrt[7]{y-1}}{3} = x$$

18. If  $\log_6(x-1) + \log_6(4) = 2$   $X = ?$  - multiply common log values together

$$\log_6 4(x-1) = 2$$

$$\log_6 4x - 4 = 2 \text{ - rearrange to remove log}$$

$$6^2 = 4x - 4$$

$$36 = 4x - 4$$

$$40 = 4x$$

$$x=10$$

19. It's not inverted because the 3 in front of the "x" should be a negative therefore (B) is the correct answer.

$$20. x^2+4x \leq -3$$

$$(x+1)(x+3) \leq 0$$

$$-1, -3$$

C) because "-3" is less than "-1" whereas in answer "b"

"-1" is not less than "-3".

$$21. 2^x = \frac{\sqrt{8}}{16^0}$$

$16^0$  is equal to one,

find a common base between the  $2^x$  and the  $\sqrt{8}$  which makes it  $2^x = \frac{\sqrt{2^3}}{1}$

Another way to write  $\sqrt{2^3}$  is to write it as  $2^{3 \times 1/2}$ , which is  $2^{3/2}$

B) because the x=to  $3\sqrt{2}$

$$22. x^3+8x^2+15x=0$$

Take out an "x"

$$x^2+8x+15=0$$

$$(x+3)(x+5)$$

$$-3, -5$$

C) because you end up with "-5 and -3" to make the equation equal to zero. And it could be zero because if all of the "x's" were zero then the whole equation would be too.

$$23. (x^2-5)(x^3+2x^2-x+1)$$

$$=(x^5+2x^4-x^3+x^2-5x^3-10x^2+5x-5)$$

$$A) (x^5+2x^4-6x^3-9x^2+5x-5)$$

24. If you graph your three points then you make a triangle which has one side equal to 4, another one equal to 10 and the hypotenuse is unknown. If you use the pythagorean theorem then you end up with the unknown side equal to  $\sqrt{116}$ . If you split it up to  $\sqrt{4} \sqrt{29}$ . It will reduce to  $2\sqrt{29}$ .

$$B) 2\sqrt{29}$$

$$25. x^2-6x+2=0 - \text{use quadratic formula to solve for } x$$

$$\frac{-b \pm \sqrt{b^2-4(a)(c)}}{2a}$$

$$2a$$

$$\frac{-(-6) \pm \sqrt{-6^2 - 4(1)(2)}}{2(1)}$$

$$\frac{6 \pm \sqrt{28}}{2} \quad \sqrt{28} \text{ breaks down into } \sqrt{7} \text{ and } \sqrt{4}, \text{ the } \sqrt{4} \text{ is } 2$$

$$\frac{6 \pm 2\sqrt{7}}{2} \quad \text{the } 2 \text{ goes into the } 6 \text{ and the } 2, \text{ so the answer is } 3 \pm \sqrt{7}$$

26.

$$\text{Area} = \pi r^2$$

$$\text{area} = 81\pi$$

$$81\pi = \pi(3r)^2$$

$$81\pi = \pi 9r^2 - \text{divide by } \pi \text{ and } 9$$

$$r^2 = 9, \text{ therefore the answer is } 9\pi$$

$$27. \tan(-\pi/4) - \pi = 180$$

$$\tan(-180/4) = \tan(-45)$$

$\tan 45 = 1$  - since it's actually  $-45$ , it lies in the 4th quadrant, in the 4th quadrant  $\tan$  is negative

$$\tan(-\pi/4) = -1$$

$$28. y = 3x^2 + 1 \text{ and } y = 2x + 9$$

plug in the corresponding  $x$  values into the equation. If the  $y$  value you find is the same as the coordinate that corresponds with the  $x$  then you have the correct answer.

$$Y = 3(2)^2 + 1 \quad Y = 2(2) + 9$$

$$y = 13 \quad Y = 13$$

(2,13)

$$29. m = 3, y\text{-intercept} = -2$$

$$y = 3x - 2$$

$$30. Y = 3\sin(2x) + 1$$