The Susan Hiller Test

ANSWERS

1. A	7. D	13. C	19. C	25. B
2. B	8. D	14. D	20. B	26. C
3. D	9. A	15. B	21. A	27. D
4. E	10. C	16. A	22. A	28. C
5. B	11. C	17. A	23. D	29. D
6. C	12. D	18. C	24. A	30. E

SOLUTIONS

1. **A**. $5a = 20$. $a = 4$.

2. **B.** $\frac{4}{3}w = 10 + w$. $\frac{1}{3}w = 10$. $w = 30$.

3. **D.** If the painter can stand on the middle rung, then the number of rungs will be an odd integer. If you divide by 2, you will get a fraction and will round UP for the middle rung. So, for the number of rungs is N, $\frac{N}{2} + 0.5$ will give the middle rung. So $\frac{N}{2} + 0.5 + 6 - 10 + 18 = N$. $14.5 = \frac{1}{2}N$. N=29.

4. **E**. All are rational. Rational numbers are those which can be expressed in a fraction form. 0=$\frac{0}{1}$ and $0.00\overline{1} = \frac{1}{900}$

5. **B.** The geometric concept of absolute value is a distance, so a distance of 5 means "=5". The distance of 12 and a number can be either $|c - 12| = 5$ or $|12 - c| = 5$. B represents this.

6. **C.** Using order of operations,

$m = 9 - 3 \div \frac{1}{3} - 1$ = $9 - 9 - 1 = -1$.

$n = 2 \div 4 \times 2 - 2$ = $\frac{1}{2} \times 2 - 2$ = $1 - 2 = -1$.

$-m^2 + n$ = $-(-1)^2 + (-1) = -1 - 1 = -2$.

7. **D.** 2x+x=2733. 3x=2733. x=911. So, there are 2x=1822 undead.

8. **D**. You can see that "cat x cat =9" so cat =c=3. You can see that "dog x dog = 1. So, dog=d=1. Cat x dog = H so H=3. Same with J so J=3. Bone x bone =4 so bone =2 and bone x cat=gerbil so G=6. $4J - 2H + G$ = 12-6+6=12

9. **A**. $\frac{d}{9} - 14 \geq d + 2$. $-\frac{8}{9}d \geq 16$. Divide by 8 to get $-\frac{1}{9}d \geq 2$. $d \leq -18$.

10. **C**. $\left(nm^2 + 2mn - n^2m\right) - \left(4nm - nm^2 + n^2m\right)$

= $nm^2 + 2mn - n^2m - 4nm + nm^2 - n^2m$

= $2nm^2 - 2mn - 2n^2m$

11. **C.** "At most" means $\leq$.

12. **D.** Solve A. $2L + 13 < L + 17$. $L < 4$. no

B. $-2L + 13 > L + 1$. $-3L > -12$. $L < 4$. no

C. $13 - 2L > 9 - L$. $-L > -4$. $L < 4$. no

D. $13 - L < 2L + 1$. $-3L < -12$. $L > 4$.

13. **C.** $a = \frac{3(3^{10})}{3^4}$ = 3^7.

$b = \left(3^{10}\right)^2 \div \left(3^{15}\right) = 3^5$. $c = \left(3^3\right)\left(3^3\right) = 3^6$.

In order from greatest to least, $a > c > b$

14. **D.** $6x + y = 13$ and $8x - 4y = -36$, The second equation gives $2x - y = -9$. Add the first and last to get 8x = 4 and $x = \frac{1}{2}$. Substitute to get $3 + y = 13$. y=10 and xy=5

15. **B.** M=1 when S=0. When Mark was 8: M=8 when S=7 and N=4. When Nathaniel was 2: N=2 when S=5 and M=6 and F=0. We don't know when "now" is so let Y be the number of years to add to get to "now." Using the last group of numbers, $(2 + Y) = \frac{2}{3}(6 + Y)$. $3(2 + Y) = 2(6 + Y)$. $6 + 3Y = 12 + 2Y$. $Y = 6$. So, in six years, we will have N=8, S=11, M=12, Fido=6. We really don't need Frank. Fido is now 6.

16. **A.** r can be 10 or -10. s can be 20 or -20. To get $r - s$ to be greatest, we want r to be 10 and s to be -20, for a difference of 30.

17. **A.** $\frac{1}{4}d+\frac{1}{1.5}d=1$. LCD=6.

$1.5d+4d=6$. $d=\frac{6}{5.5}=\frac{12}{11}$

18. **C.** P_1: $2x^2-x-15=(2x+5)(x-3)$

P_2: $2x^2-7x+5=(2x-5)(x-1)$

So, all options are factors except C. $(x+1)$

19. **C.** Marlon will go a distance of rt = 10(4)=40 miles. Maria will go a distance of 8(4)=32 miles. Total distance is 72 miles. Algebra is not needed.

20. **B.** N+Q=16 and 5N+25Q=320. Divide by 5 on the second equation to get N+5Q=64. Subtract the first and last equation to get 4Q=48 and Q=12. So, N=4 and Q-N=8

21. **A.** $|5p+12|=8$ solves to $5p+12=8$, $p=-\frac{4}{5}$ and $-5p-12=8$, $p=-4$.

$p_1<p_2$ so $-4=p_1$. $\frac{p_1}{p_2}=$

$-4\div\frac{-4}{5}=-4\bullet\frac{-5}{4}=5$

22. **A.** P$(2,k)$ and Q$(14,3k+2)$

$\frac{3k+2-k}{12}=-2$. $2k=-26$. $k=-13$

so $14-k$.= 27.

23. **D.** Since the roots of $y=a-x^2$ are 4 and -4, then it must have equation $y=(4-x)(4+x)$. This means the y-intercept is 16 (let x=0). So, the other equation must be $y=(x-8)(x-k)$ and since they meet on the y-axis, plug in (0, 16). This gives you k=2. So the second equation is $y=(x-2)(x-8)=x^2-10x+16$. So $a=16,\ b=-10,\ c=16$ and abc= -2560

24. **A.** $3\bullet(2x+5)-2\bullet(x+5)=3x+14$

$6x+15-2x-10=3x+14$. $x=9$.

25. **B**. Since the inner quantity is negative the absolute value will be the opposite of the inner quantity, or $\pi-2$.

26. **C.** Let x=2: $12-4h+4=0$, so h=4

27. **D.** Using (0, 8) and (100, 58) we get slope ½. So, we have an equation of this line is $y=\frac{1}{2}x+8$. Choice D is on this line since $0=\frac{1}{2}(-16)+8$.

28. **C.** At 3:00 the clock plays 3 tones but there are only two "spaces" between. It plays "tone, pause, tone, pause, tone." At 6:00 there are 5 pauses and the time is 5 seconds, so each is 1 second. At 12:00 there must be 11 pauses and it takes 11 seconds.

29. **D.** Robert paid 0.60X. Sarah paid 0.64X times 0.96 which gives 0.6144X The difference is 0.0144X and Sarah paid more.

30. **E.** There are an infinite number of answers. $|x-5|=|5-x|$ ... try x=0, x=1, x=2, etc. Every value of x works.