Inner School Test Part B: Answers & Selected solutions

1. $44+\frac{44}{4}$ *or* $\sqrt{4}\left(4!+4\right)-\frac{4}{4}$

2. -1, 1, 3

3. $\log_{10}\frac{1}{2}$ is negative so the inequality sign (>) should have been reversed

4. 112.5 m

$$\frac{225\,km}{h}\left(\frac{1h}{60\,\min}\right)\left(\frac{1000m}{1km}\right)\left(\frac{1\,\min}{60\,\sec}\right)=62.5\,m/s$$

$$for\ 6\ s \Rightarrow 375m$$

$$so\ \frac{30}{100}=\frac{x}{375}$$

5. $f(x)=\begin{cases}2-2x;\ x<0\\ 2;\quad 0\le x\le 2\\ 2x-2;\ x>2\end{cases}$ Determine over the intervals when the values are positives and negatives.

6. since 4, 6, 8 the LCM = 24 which implies 24n - 1

7. Answer: T= 10 years Therefore T/4 = Maxima and (3T)/4 = Minima
3(10)/4 = 7.5 years

8. t = 25
y = ax^2+bx+c -b/(2a) = 2
0 = a(2)^2-4a(2)+c <------- b = -4a
0 = 4a-8a+c
4a = c
y = ax^2-4ax+4a
1 = a(3)2-4a(3) +4a
1 = 9a-12a+4a
1=a
Therefore, c = 4(1) = 4
b = -4(1) = -4
y = x^2-4x+4 t = 9-4(-3)+4 t = 9+12+4

9. a) x = 78 b) 3^20 - 3 = x
NOTE: All logs in this answer are in base 3.
40 = 20 + 5 log (x+3) 120= 20 - 5 log (x+3)

20 = 5 log (x+3) 100= 5 log (x+3)
4 = log (x+3) 20 + log (x+3)
3^20 = x+3
X + 3 = 3^4 = 81

10. 1/2
TRICKY -> For those people who went through the problem to answer the question, what is the probability of getting eleven heads in a row with a fair coin?

11. 4 coins totaling 60 cents are two nickels and two quarters
n = # of coins in her purse. 15n + 10 = 14(n+1) n=4

12. d = 10cm
Volume of 1/2 the tank = 100cm * 40cm * 60cm = 240000cm^3
1/4 (240000) = 60000cm^3 d * 100cm * 60cm = 60000

13. $\{0, 2, -2, 3, -3\}$ Since $x^0 = 1$ set exponent = 0 and factor.

14. 5 & 97 $u = 4x^2 - 3 \Rightarrow = 4\left(\sqrt{2}\right)^2 - 3 = 5$ do the same for 5

15. $(x-1)^2 (x+1)(x+6)\left(x^2+1\right)$ use synthetic division

16. $y = \frac{a}{b},\ where\ b \neq 0$ Take limit as x approaches infinity

17. (- 0.423, 1.577) Set f"(x) = 0 $4\left(3x^2 - 6x + 2\right) = 0$
$x = \frac{6 \pm \sqrt{12}}{6}$

18. 55 mph

19. 4

20. a = 1 b = 1

21. 41

22. [2, 1, 1, 2]

23. $ 334.24

24. 1.22

25. $b^y = a^{xy} = a \quad so \quad x = \frac{1}{y}$

26. Intersect in a line

27. 84 ft

28. 1025 $a_n = 2^n + 1$

29. 41 cents

30. 9