Final revision for Unit 3

Solve these equations:

1. $2x+13=17$

2. $2x-11=35$

3. $8x+7=2x+79$

4. $\frac{1}{3}x+15=12$

5. $7(2x-5)=49$

6. $12(17-x)=5(2x+1)+1$

7. $\frac{2x+1}{7}=33-3x$

8. $\frac{1}{2}x+\frac{1}{3}x-\frac{1}{5}x-\frac{1}{7}=\frac{3}{4}$

9. $x^2-9x+20=0$

10. $x^2+7x-60=0$

11. $2x^2-3x-2=0$

12. $6x^2-11x-10=0$

13. $(x+5)(x-5)=119$

14. $3x^2-4x-5=0$ to 4 significant figures

15. $x^2-x=56$

16. $2x-1=\frac{21}{x}$

17. $\frac{4}{x}=\frac{2x-3}{x+1}$

18. $\frac{x}{4}=\frac{2x-3}{x+1}$

19. Write x^2+6x in the form $(x+a)^2+b$

Where is the minimum of the curve $y=x^2+6x$?

20. Write $x^2-20x+30$ in the form $(x+a)^2+b$

Where is the minimum of the curve $y=x^2-20x+30$?

21. Write $2x^2+24x+7$ in the form $a(x+b)^2+c$

Where is the minimum of the curve $y=2x^2+24x+7$?

22. Find the intersection point of the lines $y=2x+1$ and $y=7-x$

23. Find the intersection point of the lines $x+y=12$ and $2x-y=6$

24. Find the intersection point of the lines $5x+3y=6$ and $3x+8y=47$

Calculator practice! Giving your answer to 4 significant figures, solve the following equations:

25) $23x=189$

26) $0.19y=1.75$

27) $5\pi x=30$

28) $(2.39+\pi)x=400.57$

29) $(\pi-2)x=\pi+8$

30) $1.6\times10^{-19}N=180$

31) $17x-91=204$

32) $1837y+248=692$

33) $17(x+2)=111$

34) $\frac{y+87}{31}=5.92$

35) $x^2=167$

36) $x^2=5.43\times10^7$

37) $216x^2=8.31\times10^{-5}$

38) $9.8\pi r^2=22.7$

39) $12.8\left(7.37+r^2\right)=113.4$

40) $r^3=583.8$

41) $\frac{4}{3}\pi r^3=200$

42. Find the volume of a cone of base diameter 10 cm and height 9 cm.

43. Find the total surface area of the cone in Q42.

44. A cone has a base radius 8 cm and a slant height 17 cm. Find its volume.

45. (Tougher). A cone has a total surface area of 600cm^2 and its slant height is 10cm. Find its volume (to 3 significant figures).

46. Sketch the curves $y=x^2$ and $y=\left(x+2\right)^2$, showing the coordinates of two points on each curve (just roughly, you don't need a table of values).

47. Sketch the curves $y=x^3$ and $y=\left(x-3\right)^3-4$ showing the coordinates of two points on each curve.

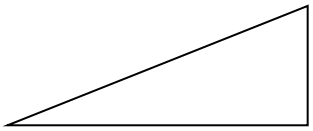
48. Sketch the curves $y=\sin(x)$ and $y=2\sin 2x$

49. Sketch the curves $y=\frac{1}{x}$, $y=\frac{1}{x+3}$ and $y=\frac{1}{x+3}+2$

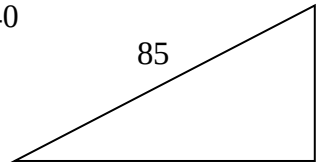
50. A baby elephant weighs 60 kg and its ears have an area of 2000 cm^2.

An adult elephant weighs 6 tonnes. Estimate the area of its ears.

51. Find the length of the missing side:



52. Find the length of the missing side:



53. A box has sides of length 3, 4 and 5 cm. What is the distance between opposite corners?

54. A cube measures 6m diagonally across opposite corners. What is the side length?

55. After a 43% price increase, a school hoodie costs £12.50

What was its original price?

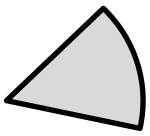
56. The current through a variable resistor is inversely proportional to its resistance.

When the resistance is 27Ω the current is 35 mA.

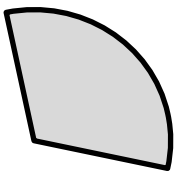
What is the current when the resistance is 350Ω ?

57. A headmaster runs the 100m (to nearest metre) in 20 seconds (to nearest second). What is his maximum possible speed? What is his minimum possible speed?

58. A sector of a circle has radius 5 cm and area $15cm^2$. What is the angle?



59. A segment of a circle has an arc length that is half of its perimeter. The area is $100\ cm^2$. What is the perimeter?



60. Write down the SohCahToa formulae: two equations "o = ", two equations "h =", two equations "a =", three equations for the angle, "x = ".