Revision Pack for Algebra 1 (Ch1, 2)

This should be used in combination with the textbook questions, think about what you are weakest at and get extra practice on those questions

1) Find a% of b in its simplest form

2) c : d = 3 : 8 write an expression for d in terms of c

3) There are cats and dogs in a field in the ratio of 2 : 3

   4 dogs leave and 4 cats arrive, the ratio is now 4 : 5

   How many dogs were there originally?

4) x is 40% greater than y

   z is 30% less than y

   Find the ratio of $x : z$ in its simplest form

5) $f : g = 3 : 5$

   Work out $6f - 2g : g - f$ in its simplest form

6) Simplify fully:

a) $\sqrt{80} + 2\sqrt{45}$ b) $\frac{9}{2\sqrt{3}}$ c) $\frac{6}{\sqrt{5}+\sqrt{2}}$ d) $\frac{\sqrt{3}-1}{2\sqrt{3}-3}$

7) Expand and simplify

a) $(4x - 3)^4$ b) $(2x + y)^3$ c) $\left(3x - \frac{1}{x}\right)^5$

8) Find the coefficient of x^4 in the expansion of $(6x - 7)^5$

9) A password is made from 2 different letters and 3 different digits in that order. How many possible passwords are there?

10) You have 4 cards with the digits 0, 1, 4, 6 on them.

    How many 4 digits even numbers can you make with these cards?

11) Factorise fully:

a) $(4x - 1)^3 + 3(4x - 1)^2$ b) $(x + 1)^2 - (2 - x)^2$

12) Some people are on a bus, 3 get off, then 12 get on, then $\frac{2}{3}$ of the people get off. The number of people on the bus now is half that we started with. Find out how many we started with.

13) Make x the subject of the following:

a) $tx^2 - m = r$ b) $\frac{x-r}{x+t} = m$ c) $s = \frac{1}{2}\sqrt{x-t} + m$

14) Simplify fully

a) $\frac{x^2-3x-10}{x^2-25} \div \frac{3x+6}{2x^2+7x-15}$ b) $\frac{2}{x+1} + \frac{3}{x-1} - \frac{1}{2x+1}$

15) Solve for x

a) $\frac{2x-1}{5} = \frac{2}{3}$ b) $\frac{1}{x+1} + \frac{2}{2x-7} = \frac{5}{6}$

16) Write in the form $a(x+b)^2 + c$

a) $2x^2 - 6x + 8$ b) $10 - 4x - x^2$

17) Find the minimum value of $20 + 4x + 2x^2$

Hence explain why $y = 20 + 4x + 2x^2$ will never cross the x axis

Answers

1) $\frac{ab}{100}$ 2) $d = \frac{8}{3}c$ 3) 54 4) 2:1 5) 4: 1 6a) $10\sqrt{5}$ b) $\frac{3\sqrt{3}}{2}$ c) $2(\sqrt{5} - \sqrt{2})$

d) $\frac{3+\sqrt{3}}{3}$ 7a) $256x^4 - 768x^3 + 864x^2 - 432x + 81$

b) $8x^3 + 12x^2y + 6xy^2 + y^3$ c) $243x^5 - 405x^3 + 270x - \frac{90}{x} + \frac{15}{x^3} - \frac{1}{x^5}$

8) -45360 9) 468000 10) 14 11a) $2(4x-1)^2(2x+1)$ b) $3(2x-1)$ 12) 18

13a) $\pm\sqrt{\frac{r+m}{t}}$ b) $\frac{mt+r}{1-m}$ c) $(2s-m)^2 + t$ 14a) $\frac{2x-3}{3}$ b) $\frac{9x^2+7x+2}{(x+1)(x-1)(2x+1)}$

15a) $\frac{13}{6}$ b) $-\frac{1}{10}$ or 5 16a) $2\left(x - \frac{3}{2}\right)^2 + \frac{7}{2}$ b) $-(x+2)^2 + 14$ 17) 19, it never goes down to zero, so the graph will never go down to the x axis