Name . . . . . .

Revision Sheet 1 – Quadratic Equations (Chapters 8 and 9)

1. Expand the following and collect like terms:

   a. $(x + 2)(x + 3)$

   b. $(s + 5)(s – 2)$

   c. $(2x + 3)(x – 1)$

   d. $(2p – 5)(3p – 4)$

2. Factorise:

   a. $x^2 + 7x + 12$

   b. $x^2 – 7x + 12$

   c. $x^2 + 4x – 12$

   d. $x^2 – 5x + 4$

   e. $x^2 – 2x – 15$

   f. $2x^2 + 7x + 3$

3. Solve the following by factorizing:

   a. $x^2 + 7x + 12 = 0$ [–3, –4]

   b. $x^2 – 5x + 6 = 0$ [2, 3]

   c. $x^2 + 7x – 18 = 0$ [2, –9]

4. Solve the following by factorizing:

   a. $x^2 + x = 6$ [2, –3]

   b. $x^2 + 6 = 5x$ [2, 3]

   c. $x^2 = 7x – 10$ [2, 5]

5. Solve using the formula:

   a. $2x^2 + 7x + 3 = 0$ [–0.5, –3]

   b. $2x^2 – 3x – 5 = 0$ [–1, 2.5]

Challenge

If you add the square of Fido's weight (in kg) to three times his weight (in kg) you get 23. Write and solve a quadratic equation to find Fido's weight. [3.47 kg]

Show working and answer on back of sheet.

Name . . . . . .

Revision Sheet 2 – Quadratic Equations

1. Simplify:

   a. $(x + 5)(x + 3)$

   b. $(2a – 3)(3a + 4)$

2. Factorise:

   a. $x^2 – 8x + 12$

   b. $x^2 – x – 12$

   c. $x^2 + 4x – 12$

   d. $2x^2 + 5x + 2$

   e. $3x^2 – 7x – 6$

   f. $4x^2 – 13x – 12$

3. Solve the following by factorizing:

   a. $x^2 + 5x + 6 = 0$ [–3, –2]

   b. $x^2 – 7x + 6 = 0$ [1, 6]

   c. $5x^2 + 13x – 6 = 0$ [0.4, –3]

4. Solve the following by factorizing:

   a. $x^2 + x = 6$ [2, –3]

   b. $2x^2 = 5x + 3$ [–0.5, 3]

5. Solve using the formula:

   a. $2x^2 + 7x + 3 = 0$ [–0.5, –3]

   b. $2x^2 – 3x – 5 = 0$ [–1, 2.5]

6. The base of a triangle is 11 cm more than its height. Its area is 40 cm^2. What is its height? [5 cm]

   Write and solve a quadratic equation to answer this on the back of the sheet.

Name . . . . . .

Revision Sheet 3 – Writing and Solving Quadratic Equations

1. Herbert thought of a number, squared it, then added the number he started with. Then he subtracted 6. This gave him 0. What are the two numbers he could have started with? [2, –3]

2. Claudia thought of a number, squared it, then subtracted the number she started with. This gave her 6. What are the two numbers she could have started with? [3, –2]

3. Willy thought of a number, squared it, then added 3 times the number he started with. This gave him 18. What are the two numbers he could have started with? [3, –6]

4. Flusey is 2 years older than Bipps If you multiply their ages together, you get 15. How old is Bipps? [3]

Name . . . . . .

Revision Sheet 4 – Function Families

For each of the following families of functions, give the general formula and an example of a particular formula. Then draw a set of axes and on them, draw three varied examples of graphs of functions from that family.

Linear

Quadratic

Cubic

Polynomial

Reciprocal

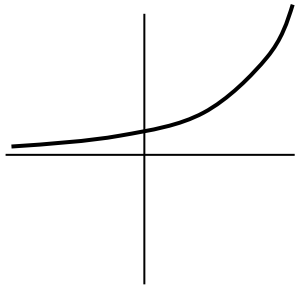
Power

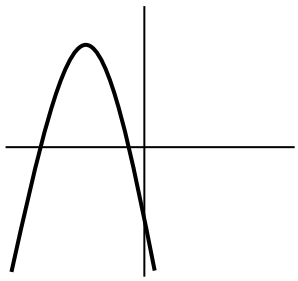
Exponential

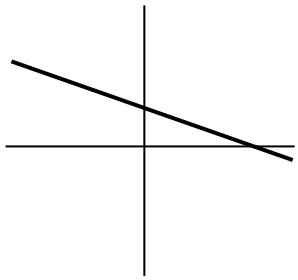
Name . . . . . .

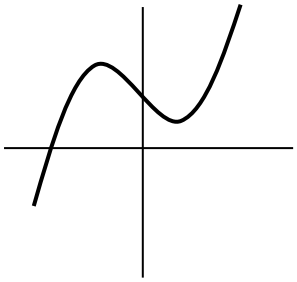
Revision Sheet 5 – Function Families

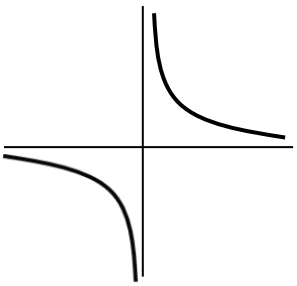
For each of these graphs, give the name of the function family to which it belongs. Also give the general formula and a particular formula, preferably one that will roughly produce the graph.

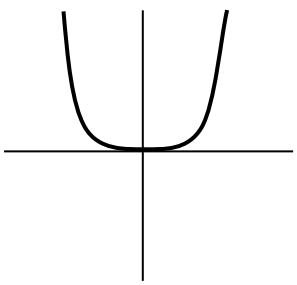












Name . . . . . .

Revision Sheet 6 – Writing and Solving Quadratic Equations

1. Katie thought of a number, then added 5, then multiplied the result by the number she started with, then added 15. This gave her 9. What are the two numbers she could have started with? [–2, –3]

2. The product of two consecutive numbers is 42. What are the two possibilities for the lowest number? [6, –7]

3. A rectangular pool is 4 m longer than it is wide. Find its width if its area is 45 m^2. [5 m]

4. The height, h, of a cannon ball at time t is given by $h = 10t - t^2$. Find the two times when its height is 24 m. [4, 6]

Name . . . . . .

Revision Sheet 7 – Writing and Solving Quadratic Equations

1. The product of two consecutive even numbers is 24. What are the two possibilities for the lowest number? [4, –6]

2. A rectangle is $2x - 2$ long and $\frac{1}{2}x + 4$ wide. Its area is 36 m^2. Find x. [4 m]

3. Jasbonne thought of a number, squared it, and added 132. This gave her 23 times the number she started with. What are the two numbers she could have started with? [11,12]

4. Slobodan thought of a number, squared it, and added 6. This gave him –5 times the number he started with. What are the two numbers he could have started with? [–2, –3]

Name . . . . . .

Revision Sheet 8 – Exponential Equations (Chapters 8 and 9)

1. Solve the following equations:

   a. $10^x = 1000$

   b. $10^x = 60$

   c. $10^x = 14.9$

   d. $10^x = 0.03$

2. Solve the following equations:

   a. $2^x = 16$

   b. $2^x = 50$

   c. $5^x = 12$

   d. $1.08^x = 2.2$

3. Solve the following equations:

   a. $5 \times 2^x = 235$ [2, –3]

   b. $4 \times 6^x - 31 = 17$ [2, 3]

   c. $0.03 \times 2^{x-5} = 235$ [2, 5]

   d. $4.85 \times 1.3^{4x+1} = 235$

4. A bacterial culture doubles its mass every hour. How long will it take to grow from 4 mg to 500 mg?

Name . . . . . .

Revision Sheet 9 – Simultaneous Equations

1. Solve $2x + y = 1$ & $3x - 2y = 12$ by graphing.

2. Solve the same equations by substitution.

3. Solve the same equations by elimination.

Name . . . . . .

Revision Sheet 10 – Simultaneous Equations

1. Solve $3x + y = 11$ & $2x - 3y = 11$ substitution.
   [$x = 4$, $y = -1$]

2. Solve the same equations by elimination.

3. Solve this problem by writing and solving simultaneous equations.
   2 hamsters and 5 rats cost \$23.50
   4 hamsters and 3 rats cost \$21.10
   Find the price of 3 hamsters and 2 rats.
   [\$14.90]

Name . . . . . .

Revision Sheet 11 – Simultaneous Equations

1. Solve $2x + y = 1$ & $3x - 2y = 12$ by graphing.

2. Solve the same equations by substitution.

Name . . . . . .

Revision Sheet 12 – Fractional Indices and Power Equations

1. Write in power form:

   a. $\sqrt[4]{x^3}$

   b. $\sqrt[3]{a^5}$

   c. $(\sqrt[4]{s})^7$

   d. $(\sqrt[3]{5})^4$

2. Write in radical form (both ways):

   a. $h^{2/5}$

   b. $b^{1¾}$

   c. $t^{0.75}$

   d. $8^{1.2}$

   e. $c^{-½}$

   f. $10^{-2.5}$

3. Evaluate without a calculator (show working)

   a. $\sqrt[4]{1^3}$

   b. $(\sqrt[4]{16})^7$

   c. $\sqrt[3]{27^5}$

   d. $(\sqrt[3]{-8})^4$

4. Evaluate with a calculator:

   a. $3^{0.75}$

   b. $8^{1.2}$

   c. $10^{3/5}$

   d. $6^{2¾}$

   e. $4^{-½}$

   f. $100^{-4.23}$

5. Solve:

   a. $h^5 = 20$

   b. $s^3 = 12$

   c. $x^{2.4} = 124$

   d. $t^{0.75} = 0.054$

   e. $n^{¾} = 5$

   f. $c^{-5/7} = 9$

Name . . . . . .

Revision Sheet 13 – Fractional Indices and Power Equations

1. Write in power form:

   a. $\sqrt[5]{x^3}$

   b. $\sqrt[3]{a^7}$

   c. $(\sqrt[4]{s})^7$

   d. $(\sqrt[3]{5})^8$

2. Write in radical form (both ways):

   a. $h^{3/5}$

   b. $b^{1¾}$

   c. $t^{0.6}$

   d. $8^{1.2}$

   e. $c^{-½}$

   f. $5^{-2.6}$

3. Evaluate without a calculator (show working)

   a. $\sqrt[4]{1^9}$

   b. $(\sqrt[3]{8})^5$

   c. $\sqrt[3]{27^5}$

   d. $(\sqrt[5]{-32})^3$

4. Evaluate with a calculator:

   a. $3^{0.7}$

   b. $8^{1.25}$

   c. $10^{3/8}$

   d. $12^{2¾}$

   e. $4^{-½}$

   f. $100^{-2.27}$

5. Solve:

   a. $h^6 = 400$

   b. $x^{1.4} = 63.9$

   c. $t^{0.75} = 0.054$

   d. $n^{¾} = 5$

   e. $c^{-5/11} = 0.021$

6. Toady put $4000 in the bank getting compound interest. 6 years later, it had grown to $5230. What was the interest rate? Show working on the back of this sheet.

Name . . . . . .

Revision Sheet 14 – Algebraic Fractions

1. Simplify:

a. $\frac{x}{2}+\frac{x}{3}$

b. $\frac{1}{x}-\frac{2}{x-3}$

c. $\frac{8x+12}{4x+12}$

d. $\frac{3x+15}{2x+10}$

e. $\frac{x^2+5x+6}{x+2}$

2. Simplify:

a. $\frac{a^2-7a+12}{a^2-2a-3}$

b. $\frac{a^2-1}{a^2+3a+2}\times\frac{a+2}{a^2-a-2}$

c. $\frac{a^2-1}{a^2-2a-3}\div\frac{a+2}{a^2-a-2}$

d. $\frac{a^2+4a+3}{a^2+3a+2}+\frac{a^2+a-2}{a+2}$