Daily Practice 29.11.2017

Q1. A book costs £10.28 and is marked 15% off in the sale, how much is it in the sale?

£10.28 × 0.85 = £8.74

Q2. Solve the equaon $\frac{1}{4}x + 3 = 21 - 2x$

×4 $x + 12 = 84 - 8x$

$9x + 12 = 84$

$9x = 72$ $x = 8$

Q3. Given n = 4 and h = -5, what is the value of $2n^2 - 5h$?

$2(4)^2 - 5(-5)$

$= 32 + 25 = 57$

Q4. 380 x 360 (non-calculator)

380 × 360

000

22800

+114000

136800

Q5. Solve 4x + 3 > 7x - 9

-4x -4x

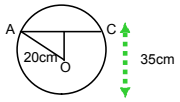
3 > 3x - 9

+9 +9

12 > 3x

4 > x $x < 4$

~~Q5. Calculate the length of AC~~



Today we will be learning about functions.

Functions

A function is an equation that changes an input number 'x' into an output number f(x) or y.

For example, f(4) means I have substituted 4 for x into the function.

When talking about functions, we call the input numbers the domain and the output numbers the range.

If you wanted to talk about 2 different functions, you might use f(x) and g(x).

Functions

1. Given a function $f(x) = x^2 + 3$

The domain is {-1, 0, 1, 2, 3}, calculate the range

$f(-1) = (-1)^2 + 3 = 4$ $f(2) = 2^2 + 3 = 7$

$f(0) = 0^2 + 3 = 3$ $f(3) = 3^2 + 3 = 12$

$f(1) = 1^2 + 3 = 4$

Range = {4, 3, 4, 7, 12}

Daily Practice 30.11.2017

Q1. Simplify $\frac{2p^1 \times 4p^1 \times p^{\frac{1}{2}}}{p^5 \times p^4}$ $= \frac{8p^{2.5}}{p^9} = 8p^{-6.5} = \frac{8}{p^{6.5}}$

Q2. Solve $\frac{7g + 4}{6} > 2g - 11$

×6 ×6

$7g + 4 > 12g - 66$

$-12g \quad -12g$

$-5g + 4 > -66$ $-5g > -70$ $g < 14$

Q3. State the equation of the line joining (-1, 4) and (0, 5)

$m = \frac{5-4}{0-(-1)} = \frac{1}{1} = 1$ y-intercept = 5 $y = x + 5$

Q4. Find the area of the triangle shown

$3\frac{1}{2}cm$

$3\frac{1}{2}cm$

$\frac{(3.5)^2}{2}$ $\frac{7}{2} \times \frac{7}{2} = \frac{49}{4}$

$\frac{1}{2}(\frac{49}{4}) = \frac{49}{8} = 6\frac{1}{8}cm^2$

Today we will be continuing to learn about functions.

2. Given the function $g(x) = -x + 3 - 2x^2$. The domain is {-3, 2, 8, 5, 1}, calculate the range

3. Given the function $h(x) = 2x^3 - 8x + 4$. The domain is {-2, -1, 0, 2, 4, 8}, calculate the range

4. Given that $f(x) = 5x - 1$, find the value of

(i) f(-2) (ii) f(0.2)

(iii) f(-10) (iv) f(2k)

5. If $f(x) = 3x - 12$ and $g(x) = 2 - 4x$, solve these equations:

(i) f(x) = 4

(ii) g(x) = -10

(iii) g(x) = f(4)

(iv) g(x) = f(x)

Functions

Examples:

If $f(x) = 3x - 12$ and $g(x) = 2 - 4x$, solve these equations:

(i) f(x) = 4

$3x - 12 = 4$
$3x = 16$
$x = \frac{16}{3} = 5\frac{1}{3}$

(ii) g(x) = -10

$-10 = 2 - 4x$
$-12 = -4x$
$12 = 4x$
$x = 3$

(iii) g(x) = f(4)

$f(4) = 3(4) - 12 = 0$
$2 - 4x = 0$
$-4x = -2$
$-x = -0.5$
$x = 0.5$

(iv) g(x) = f(x)

$2 - 4x = 3x - 12$
$+4x \quad +4x$
$2 = 7x - 12$
$14 = 7x$
$x = 2$

pg. 18 Q7 onwards

Daily Practice 1.12.2017

Q1. Solve $\frac{5x}{2} + \frac{x}{3} = 17$

$5x + 2x = 34$
$15x + 2x = 102$
$17x = 102$
$x = 6$

Q2. Simplify $\frac{4k^2 \times 3k \times 2k}{2k \times 3k^3}$ $= \frac{24k^4}{6k^4} = 4$

Q3. Write in scientific notation 0.0000000045

4.5×10^{-9}

Q4. Find 67% of 8000 (non-calculator)

$10\% = 800$
$50\% = 4000$
$70\% = 5600$
$3\% = 240$
$5600 - 240 = 5360$

Q5. Simplify $(3k^2)^3$ $= 3k^2 \times 3k^2 \times 3k^2 = 27k^6$

Today we will be continuing to practice functional notation.

19. f(x) = 5x + 3 and g(x) = 7x – 11.
Given that f(x) = g(x), find x.

20. h(x) = 5(x – 3) and k(x) = 3x – 5.
Given that h(x) = k(x), find x.

21. f(x) = 4x + 5 and g(x) = 2x – 3.
Given that f(x) = 3g(x), find x.

10. $f(x) = \frac{1}{2}x^3 + 3x - 4$. Find the value of f(-2).

11. f(x) = 5x – 4.
(a) Find the value of f(3).
(b) Given f(a) = 21, find the value of a.

12. f(x) = 4x + 3.
(a) Find the value of f(4) + f(-2)
(b) Given f(c) = 5, find the value of c.

$f(x) = \frac{2x^2 + 3x}{10}$. Find the value of (5)

$g(x) = 3x^2 - \frac{x}{4}$. Find the value of g(-4).

Daily Practice 4.12.2017

Q1. Multiply out and simplify $2(3x - 4) - 7x$ $6x - 8 - 7x$ $-x - 8$

Q2. Solve $\frac{4x+5}{7} = 3$ $4x + 5 = 21$ $4x = 16$ $x = 4$

Q3. Simplify $\frac{2p \times 6p^2}{3p}$ $\frac{12p^3}{3p} = 4p^2$

Q4. Evaluate $\sqrt[5]{32}$ = 2

Q5. Simplify $(3p^2)^3$ = $27p^6$

Today we will be learning about quadratic functions and how to sketch them.

Sketching Quadratic Functions

Quadratic functions are functions where 2 is the highest power of the variable i.e. x^2

If you sketch a quadratic function, it will make a curve known as a parabola.

A quadratic function can be sketched using a similar method to sketching a straight line (using a table of values).

Because there is an x^2 term, the graph will get quite large quite quickly.

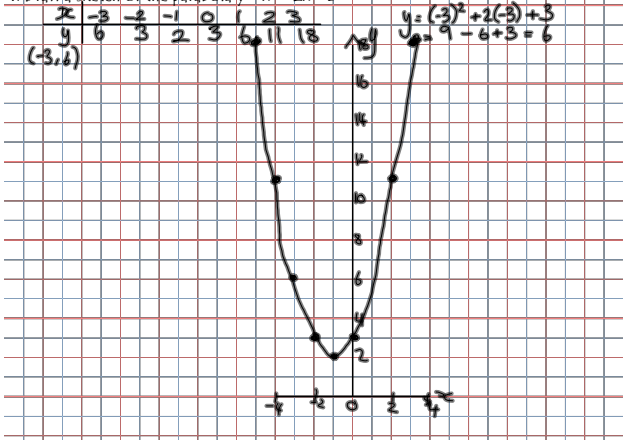
Examples:

1. Draw a sketch of the parabola $y = x^2 + 2x + 3$

x	-3	-2	-1	0	1	2	3
y	6	3	2	3	6	11	18

(-3, 6)

$y = (-3)^2 + 2(-3) + 3$ $y = 9 - 6 + 3 = 6$



Sketching Quadratic Functions

Examples:

1. Draw a sketch of the parabola $y = x^2 + 2x + 3$

Sketching Quadratic Functions

2. Draw a sketch of the parabola $f(x) = (x - 1)^2$

Sketching Quadratic Functions

Sketch the following quadratic functions:

(a) $y = x^2$

(b) $y = 2x^2 - 3x$

(c) $f(x) = -x^2 + x - 4$

(d) $f(x) = 2x^2 - 4x - 3$

(e) $g(x) = (x - 5)^2$

Daily Practice 6.12.2017

Q1. Given $f(x) = 3x - 4$, what is the value of x when $f(x) = 11$?

$3x - 4 = 11$

$3x = 15$

$x = 5$

Q2. Solve $\frac{3x-1}{5} + 3 = 2x + 1$

$3x - 1 + 15 = 10x + 5$

$9 = 7x$

$x = \frac{9}{7}$

Q3. Simplify $\frac{(3k \times 4k^4)^2}{2k^3}$

$= \frac{(12k^5)^2}{2k^3} = \frac{144k^{10}}{2k^3} = 72k^7$

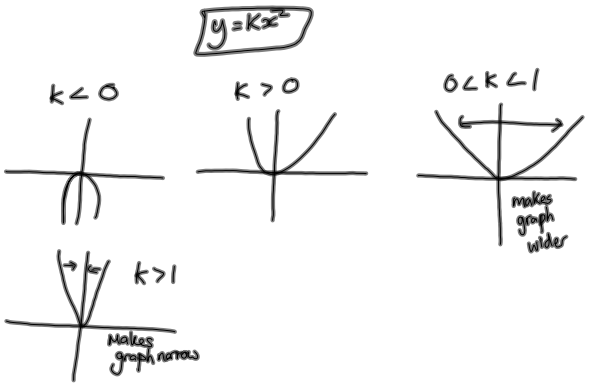
Q4. State the equation of the line joining (-3, 2) and (0, 4)

$m = \frac{4-2}{0-(-3)} = \frac{2}{3}$

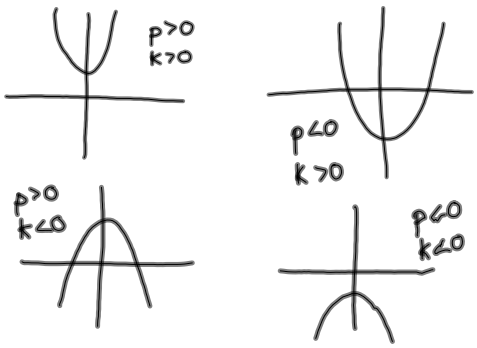
$y = mx + c$

$y = \frac{2}{3}x + 4$

Today we will be investigating the effect of changing the equation of a quadratic function.



$y = kx^2 + p$



Daily Practice 7.12.2017

Q1. Given f(x) = 4x - 5, find the value of f(-5)

$f(-5) = 4(-5) - 5$
$= -20 - 5 = -25$

Q2. Write 90 000 000 in scientific notation

9×10^7

Q3. State the equation of the line joining (0, 5) and (2, -4)

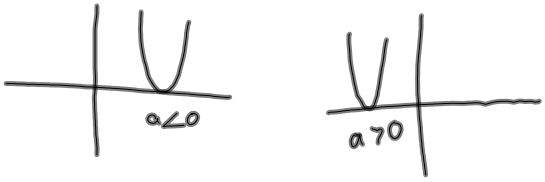
$m = \frac{-4-5}{2-0} = \frac{-9}{2}$ $c = 5$ $y = -\frac{9}{2}x + 5$

Q4. Simplify $\frac{(2k^2 \times 5k^5)}{4k^3}$

$\frac{10k^7}{4k^3} = \frac{5}{2}k^4$

Today we will continue to learn about the link between the equation of a quadratic function and its graph.

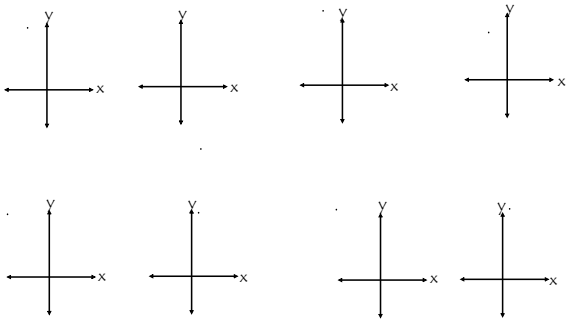
$y = (x+a)^2$



$y = (x+a)^2 + b$

Interpreting Quadratic Functions

Assume k > 0 for all



$y = x^2 + 3$

$y = -x^2 - 2$

$y = (x-4)^2$

$y = -(x-2)^2$

$y = (x+3)^2$

$y = (x+2)^2 - 3$

$y = -(x+4)^2 + 1$

$y = -(x-2)^2 + 5$

$y = (x+10)^2 - 7$

$y = -x^2 + 6$

$y = 6 - (x+2)^2$

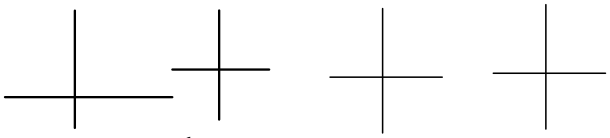
$y = -(x+2)^2 + 6$

$y = -3 + (x - 4)^2$

Interpreting Quadratic Functions

Draw a rough sketch of the following functions

(a) $y = 2x^2$ (b) $y = -0.5x^2$ (c) $y = (x + 3)^2$ (d) $y = x^2 + 4$



(e) $y = -(x + 2)^2$ (f) $y = (x - 5)^2 + 3$ (g) $y = -x^2 + 3$