Maths Answers

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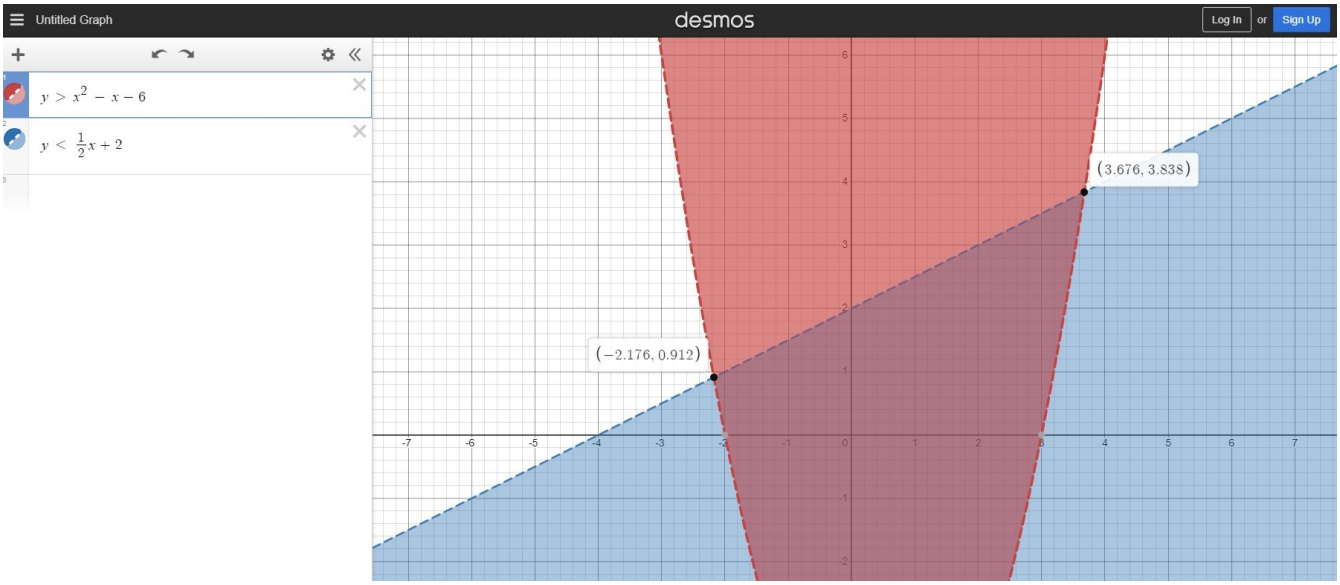
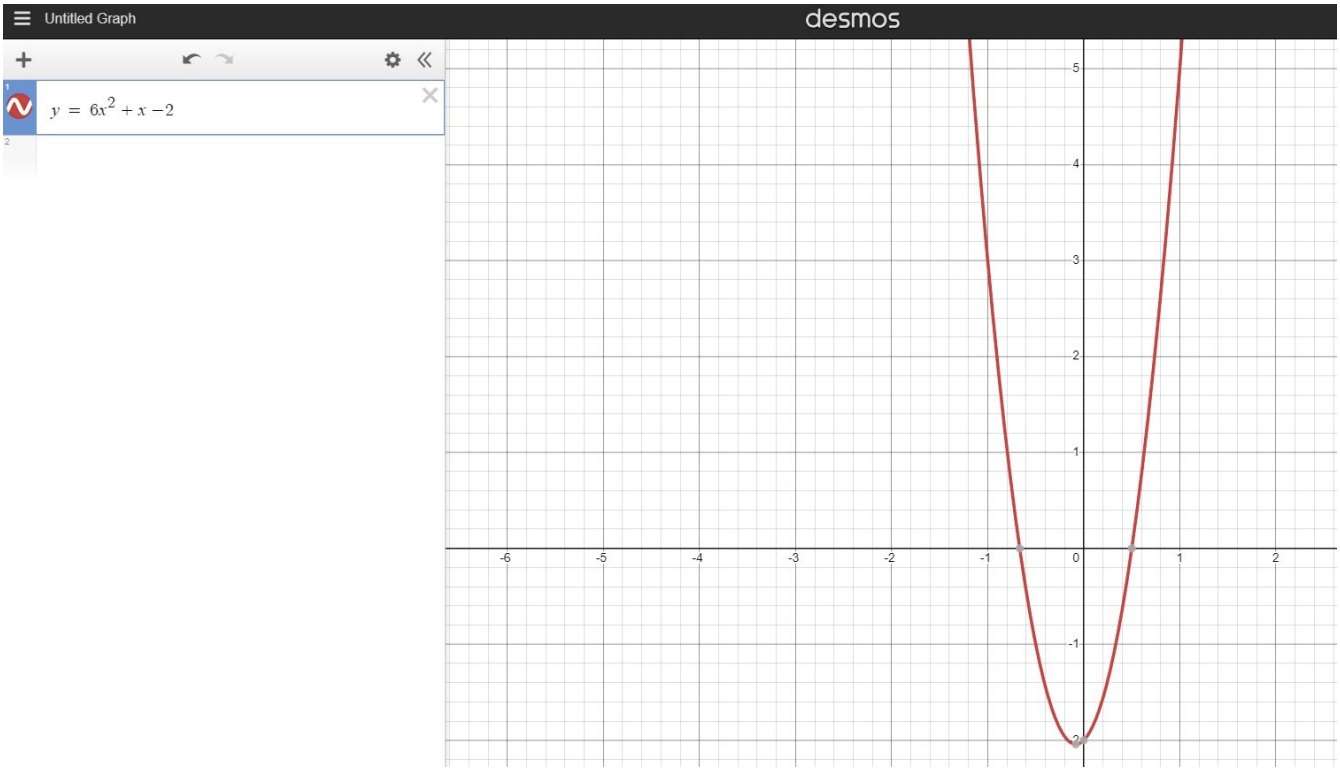
Question 7

Plot this into your graph paper. I used an online tool called desmos.com to plot it.



Question 8

Plot this into your graph paper.



Question 9

General equation of a circle: $(x-a)^2 + (y-b)^2 = r^2$

We know the center is (1, -3). and the radius is 5.

Substitute the known center, and radius values, into the general equation.

$$(x-1)^2 + (y-(-3))^2 = 5^2$$

Simplify:

$$(x-1)^2+(y+3)^2=25$$

Expand the squared brackets, and simplify:

$$x^2-x-x+1+y^2+3y+3y+9=25$$

$$x^2-2x+y^2+6y+10=25$$

$$x^2+y^2-2x+6y-15=0$$

Question 10

$$x^2+y^2+10x-2y-10=0$$

$$x^2+10x+y^2-2y-10=0$$

$$(x-(-5))^2+(y-1)^2=6^2$$

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Exercise 2.1

Question 1

$$f(1) = 5^x = 5^1 = 5$$

Question 2

Already answered in the book.

Question 3

$$h(4) = 2(2^x) = 2(2^4) = 2(16) = 32$$

Question 4

$$g(2) = -6(3^x) = -6(3^2) = -6(9) = -54$$

Question 5

$$f(4) = -(2^x) = -(2^4) = -(16) = -16$$

Question 6

$$h(2) = 2(5^x) = 2(5^2) = 2(25) = 50$$

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Question 7

x	-3	-2	-1	0	1	2	3
$y_1 = 3^x$	.037	.111	.333	1	3	9	27
$y_2 = 2(3^x)$	.074	.222	.666	2	6	18	54
$y_3 = \frac{1}{2}(3^x)$	.0185	.055	.166	0.5	1.5	4.5	13.5
$y_4 = 3^x + 2$	2.037	2.111	2.333	3	5	11	29
$y_5 = 3^x - 2$	-1.962	-1.88	-1.666	-1	1	7	25

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Question 8

x	-3	-2	-1	0	1	2	3
$y_1 = (\frac{1}{2})^x$	8	4	2	1	0.5	0.25	0.125
$y_2 = 2(\frac{1}{2})^x$	16	8	4	2	1	0.5	0.25
$y_3 = \frac{1}{2}(\frac{1}{2})^x$	4	2	1	0.5	0.25	0.125	0.0625
$y_4 = (\frac{1}{2})^x + 2$	10	6	4	3	2.5	2.25	2.125
$y_5 = (\frac{1}{2})^x - 2$	6	2	0	-1	-1.5	-1.75	-1.875

Question 9

x	-3	-2	-1	0	1	2	3
$y_1 = -4^x$	-0.015625	-0.0625	0.25	-1	-4	-16	-64
$y_2 = 2(4^x)$	-0.03125	-0.125	-0.5	-2	-8	-32	-128
$y_3 = -\frac{1}{2}(4^x)$	-0.007813	-0.03125	-0.125	-0.5	-2	-8	-32
$y_4 = -4^x + 2$	1.984375	1.9375	1.75	1	-2	-14	-62
$y_5 = -4^x - 2$	-2.015625	-2.0625	-2.25	-3	-6	-18	-66

Question 10

x	-3	-2	-1	0	1	2	3
$y_1 = 5^{-x}$	125	25	5	1	0.2	0.04	0.008
$y_2 = 2(5^{-x})$	250	50	10	2	0.4	0.08	0.016
$y_3 = \frac{1}{2}(5^{-x})$	62.5	12.5	2.5	0.5	0.1	0.02	0.004
$y_4 = 5^{-x} + 2$	127	27	7	3	2.2	2.04	2.008
$y_5 = 5^{-x} - 2$	123	23	3	-1	-1.8	-1.96	-1.992

Question 11

x	-3	-2	-1	0	1	2	3
$y_1 = 2^{x+1}$	0.25	0.5	1	2	4	8	16
$y_2 = 2(2^{x+1})$	0.5	1	2	4	8	16	32
$y_3 = \frac{1}{2}(2^{x+1})$	0.125	0.25	0.5	1	2	4	8
$y_4 = 2^{x+1} + 2$	2.25	2.5	3	4	6	10	18
$y_5 = 2^{x+1} - 2$	-1.75	-1.5	-1	0	2	6	14

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x	-3	-2	-1	0	1	2	3
$y_1 = 4^{x-2}$	0.000977	0.003906	0.015625	0.0625	0.25	1	4
$y_2 = 2(4^{x-2})$	0.001953	0.007813	0.03125	0.125	0.5	2	8
$y_3 = \frac{1}{2}(4^{x-2})$	0.000488	0.001953	0.007813	0.03125	0.125	0.5	2
$y_4 = 4^{x-2} + 2$	2.000977	2.003906	2.015625	2.0625	2.25	3	6
$y_5 = 4^{x-2} - 2$	-1.999023	-1.996094	-1.984375	-1.9375	-1.75	-1	2

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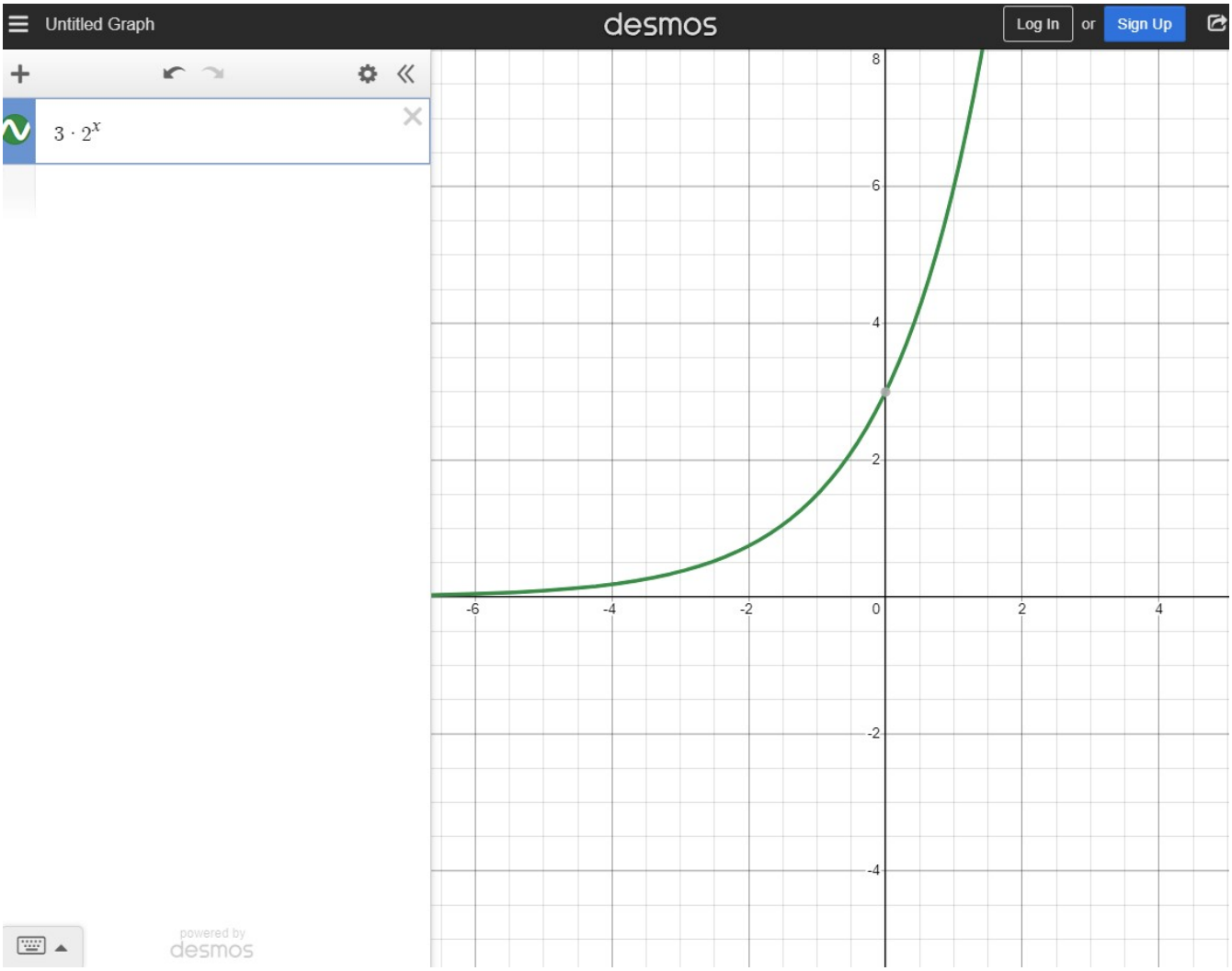
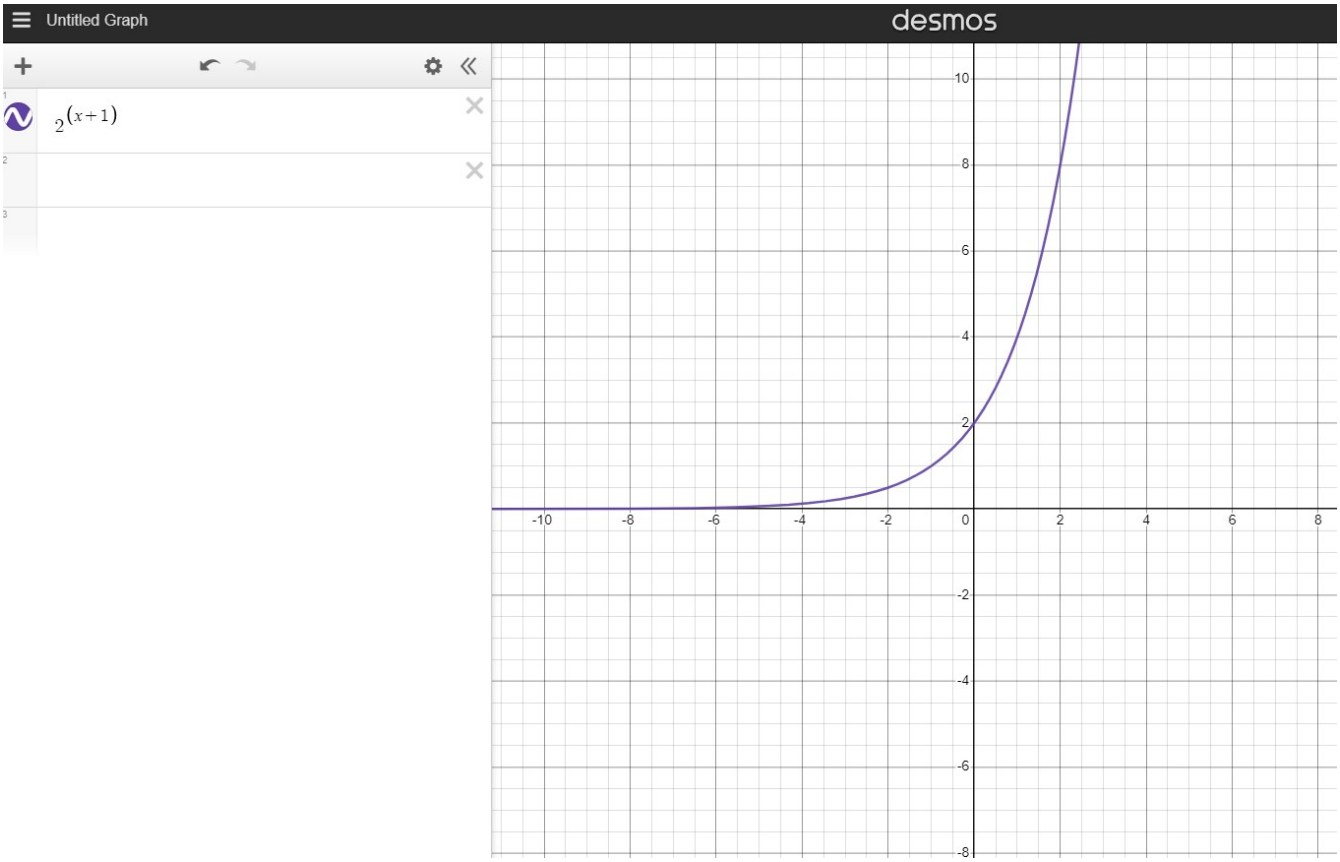
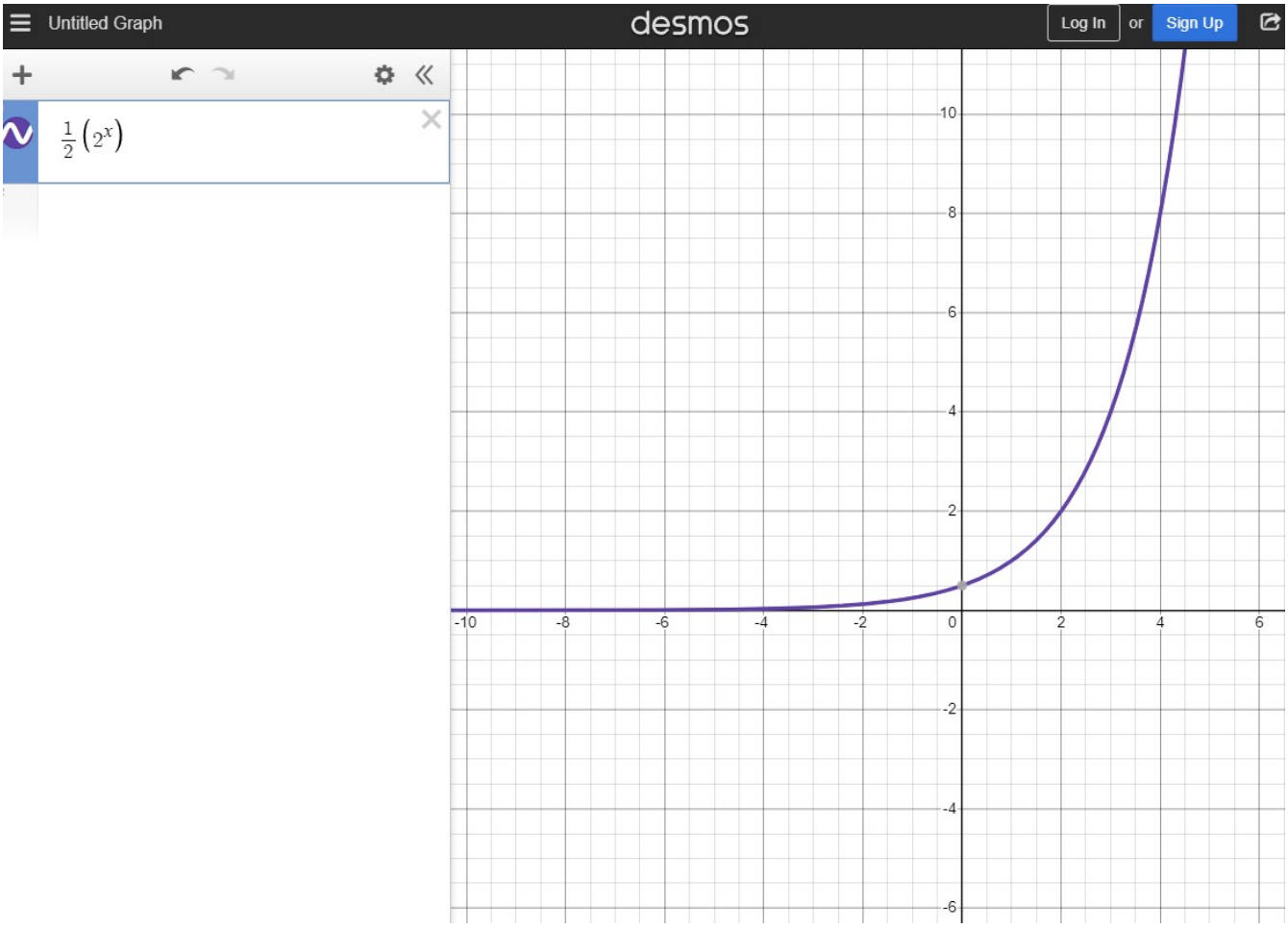
Question 13



Question 14


Untitled Graph
desmos
$_2(x+1)$

Question 15


Untitled Graph
desmos
Log In
or
Sign Up
$\frac{1}{2}\left(2^x\right)$

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Question 17

$$3^{3x+5} = 3^{x+4}$$

$$3x + 5 = x + 4$$

$$3x - x = 4 - 5$$

$$2x = -1$$

$$x = -\frac{1}{2}$$

Question 18

$$3^{2t} = 3^{4t-6}$$

$$2t = 4t - 6$$

$$2t - 4t = -6$$

$$-2t = -6$$

$$2t = 6$$

$$t = 6/2$$

$$t = 3$$

Question 19

$$7^{5w} = 7^{3w-10}$$

$$5w = 3w - 10$$

$$5w - 3w = -10$$

$$2w = -10$$

$$w = -10/2$$

$$w = -5$$

Question 21

$$9^{t+6} = \frac{1}{9^{t+2}}$$

$$9^{t+6} = 9^{-1(t+2)}$$

$$t + 6 = -1(t + 2)$$

$$t + 6 = -t - 2$$

$$t + t = -2 - 6$$

$$2t = -8$$

$$t = -8/2$$

$$t = -4$$

Question 22

There is a mistake in the book here. The example from the book is:

$$2^x \cdot 2^3 = 2^5$$

$$2^{3x} = 2^5$$

$$3x = 5$$

$$x = \frac{5}{3}$$

The second line is wrong, it should be:

$$2^{3+x} = 2^5$$

Then...

$$3 + x = 5$$

$$x = 5 - 3$$

$$x = 2$$

The correct answer is 2, not $\frac{5}{3}$

Question 23

$$5^{2y} \cdot 5^4 = 5^6$$

$$5^{2y+4} = 5^6$$

$$2y + 4 = 6$$

$$2y = 6 - 4$$

$$2y = 2$$

$$y = 2/2$$

$$y = 1$$

Question 24

$$3^{5c} \cdot 5^{5c} = 15^{9c-4}$$

$$15^{5c} = 15^{9c-4}$$

$$5c = 9c - 4$$

$$5c - 9c = -4$$

$$-4c = -4$$

$$4c = 4$$

$$c = 4/4$$

$$c = 1$$

Question 25

$$2^{2p} \cdot 7^{2p} = 14^{6p-2}$$

$$14^{2p} = 14^{6p-2}$$

$$2p = 6p - 2$$

$$2p - 6p = -2$$

$$-4p = -2$$

$$4p = 2$$

$$p = 2/4$$

$$p = 1/2$$

$$p = 0.5$$