Name:

Exam Style Questions

Trial and Improvement

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser
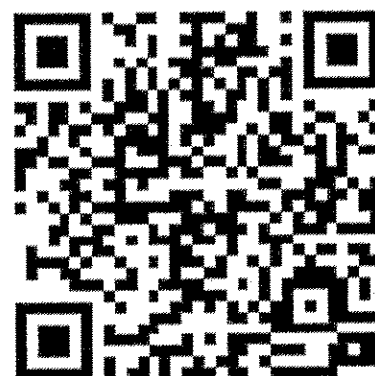
You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

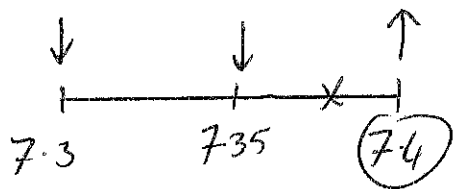www.corbettmaths.com/contents

Video 116

1. The equation $x^2 + x = 62$

has a solution between 7 and 8.

Use trial and improvement to find this solution.
Give your answer to one decimal place.

x	$x^2 + x$	Comment
7	$7^2 + 7 = 56$	too low
8	$8^2 + 8 = 72$	too high
7.3	$7.3^2 + 7.3 = 60.59$	too low
7.4	$7.4^2 + 7.4 = 62.16$	too high
7.35	$7.35^2 + 7.35 = 61.3725$	too low

7.3   7.35   7.4
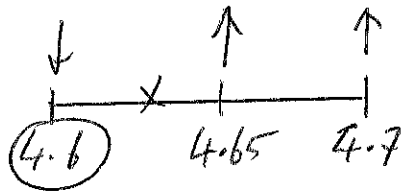
$x = \underline{7.4}$

(4)

2. The equation $x^2 - 2x = 12$

has a solution between 4 and 5.

Use trial and improvement to find this solution.
Give your answer to one decimal place.

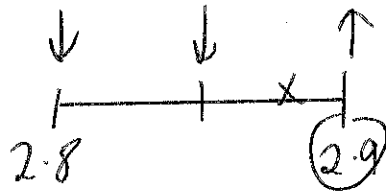| x	$x^2 - 2x$	Comment
4	$4^2 - 2 \times 4 = 8$	too low
5	$5^2 - 2 \times 5 = 15$	too high
4.5	$4.5^2 - 2 \times 4.5 = 11.25$	too low
4.6	$4.6^2 - 2 \times 4.6 = 11.96$	too low
4.7	$4.7^2 - 2 \times 4.7 = 12.69$	too high
4.65	$4.65^2 - 2 \times 4.65 = 12.3225$	too high

4.6   4.65   4.7

$x = \quad 4.6$

(4)

3. The equation $x^3 + 3x = 32$

has a solution between 2 and 3.

Use trial and improvement to find this solution.
Give your answer to one decimal place.

x	$x^3 + 3x$	Comment
2	$2^3 + 3 \times 2 = 14$	too low
3	$3^3 + 3 \times 3 = 36$	too high
2.8	$2.8^3 + 3 \times 2.8 = 30.352$	too low
2.9	$2.9^3 + 3 \times 2.9 = 33.089$	too high
2.85	$2.85^3 + 3 \times 2.85 = 31.699125$	too low

$x = \underline{\quad 2.9 \quad}$
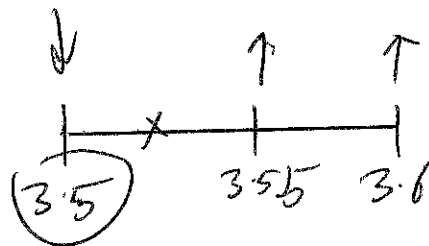
(4)

4. The equation

$$x^3 + 2x = 50$$

has a solution between 3 and 4.

Use trial and improvement to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

x	$x^3 + 2x$	Comment
3	$3^3 + 2 \times 3 = 33$	too low
4	$4^3 + 2 \times 4 = 72$	too high
3.5	$3.5^3 + 2 \times 3.5 = 49.875$	too low
3.6	$3.6^3 + 2 \times 3.6 = 53.856$	too high
3.55	$3.55^3 + 2 \times 3.55$ $= 51.838875$	too high

x = 3.5
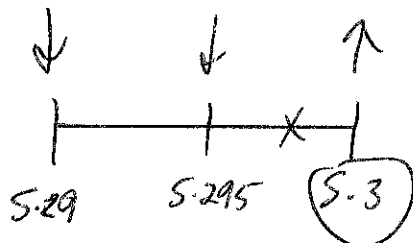
(4)

5. The equation

$$x^3 + 4x = 170$$

has a solution between 5 and 6.

Use trial and improvement to find this solution.
Give your answer correct to 2 decimal places.
You must show all your working.

x	$x^3 + 4x$	Comment
5	$5^3 + 4 \times 5 = 145$	too low
6	$6^3 + 4 \times 6 = 240$	too high
5.3	$5.3^3 + 4 \times 5.3 = 170.077$	too high
5.2	$5.2^3 + 4 \times 5.2 = 161.408$	too low
5.29	$5.29^3 + 4 \times 5.29 = 169.195889$	too low
5.295	$5.295^3 + 4 \times 5.295 = 169.6360474$	too low

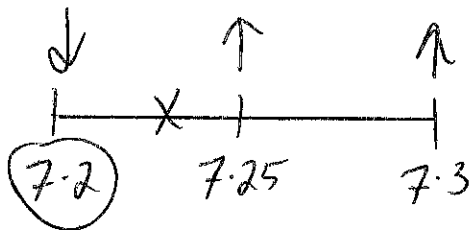$x =$ 5.30

(5)

6. The equation

$$(x + 1)(x + 3) = 84$$

has a solution between 7 and 8.

Use trial and improvement to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

x	$(x+1)(x+3)$	Comment
7	$(7+1)(7+3) = 80$	too low
8	$(8+1)(8+3) = 99$	too high
7.2	$(7.2+1)(7.2+3) = 83.64$	too low
7.3	$(7.3+1)(7.3+3) = 85.49$	too high
7.25	$(7.25+1)(7.25+3) =$ 84.5625	too high

$x =$ ....7.2........

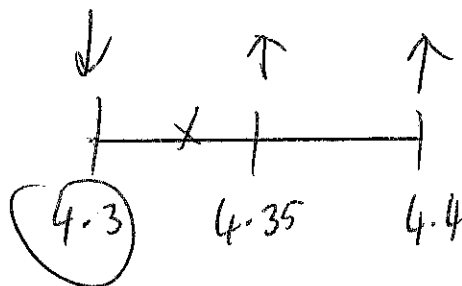**(4)**

7. The equation

$$2x^2 + 3x = 50$$

has a solution between 4 and 5.

Use trial and improvement to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

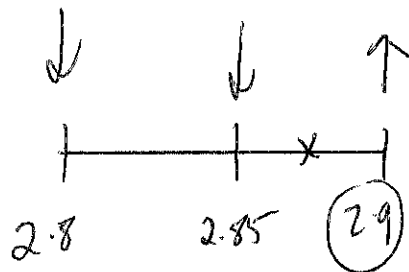| x	$2x^2 + 3x$	Comment
4	$2 \times 4^2 + 3 \times 4 = 44$	too low
5	$2 \times 5^2 + 3 \times 5 = 65$	too high
4.5	$2 \times 4.5^2 + 3 \times 4.5 = 54$	too high
4.4	$2 \times 4.4^2 + 3 \times 4.4^2 \ 51.92$	too high
4.3	$2 \times 4.3^2 + 3 \times 4.3 = 49.88$	too low
4.35	$2 \times 4.35^2 + 3 \times 4.35 = 50.895$	too high

$x = $ 4.3

(4)

8. The equation

$$x^3 + 2x^2 = 40$$

has a solution between 2 and 3.

Use trial and improvement to find this solution.
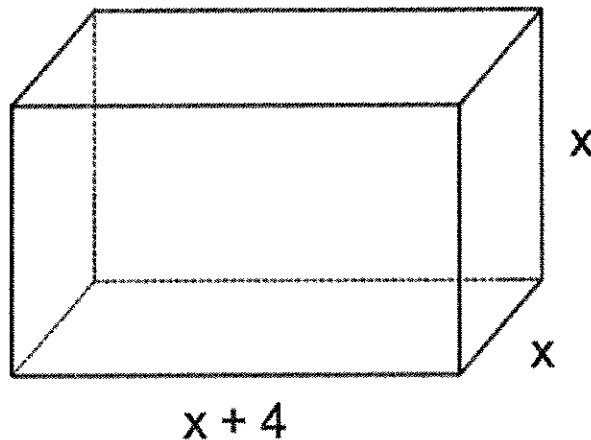Give your answer correct to 1 decimal place.
You must show all your working.

x	$x^3 + 2x^2$	Comment
2	$2^3 + 2 \times 2^2 = 16$	too low
3	$3^3 + 2 \times 3^2 = 45$	too high
2.8	$2.8^3 + 2 \times 2.8^2 =$ ~~37.634~~ 37.632	too low ~~high~~
2.9	$2.9^3 + 2 \times 2.9^2 = 41.209$	too high
2.85	$2.85^3 + 2 \times 2.85^2 = 39.394125$	too low

2.8   2.85   (2.9)

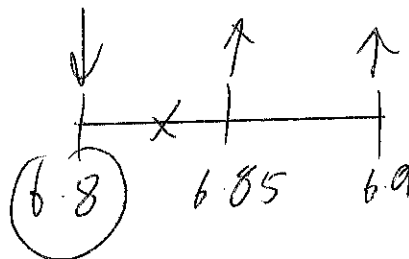x = ... 2.9 ....

(4)

9. Shown below is a cuboid.

The volume of the cuboid is 500cm³.
An expression for the volume of the cuboid is $x^3 + 4x^2$

Use trial and improvement to find the value of x to 1 decimal place.

x	$x^3 + 4x^2$	Comment
4	$4^3 + 4 \times 4^2 = 128$	too low
6	$6^3 + 4 \times 6^2 = 360$	too low
7	$7^3 + 4 \times 7^2 = 539$	too high
6.8	$6.8^3 + 4 \times 6.8^2 =$ 499.392	too low
6.9	$6.9^3 + 4 \times 6.9^2$ $= 518.949$	too high
6.85	$6.85^3 + 4 \times 6.85^2 = 509.10..$	too high

6.8   6.85   6.9

x = 6.8

(4)