Mathematics Revision Notes and Workbook

for Year 9 to Year 13

Guo DeLiang Thomas 郭德良

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1. Number

Example

Work out $103\frac{7}{8}+4\frac{5}{6}$

Solution:

$$
\begin{aligned}
& 103\frac{7}{8}+4\frac{5}{6} \\
&= 103\frac{21}{24}+4\frac{20}{24} && \textit{Change to same denonminator} \\
&= 107\frac{21+20}{24} && \textit{Fraction Addition} \\
&= 108\frac{17}{24}
\end{aligned}
$$

Example Work out $28\frac{3}{4} - 12\frac{5}{6}$

Solution:

$$
\begin{aligned}
& 28\frac{9}{12} - 12\frac{10}{12} \\
&= 27\frac{25}{12} - 12\frac{27}{12} \\
&= 15\frac{25+3}{30} \\
&= 15\frac{28}{30}
\end{aligned}
$$

Change to same denonminator

Compare $\frac{25}{30}\ \frac{27}{30}$

1. Work out

(a) $-5+3=$ . . . . . (b) $-5+10=$ . . . . . .

(c) $-5-3=$ . . . . . (d) $-5+1=$ . . . . . .

(e) $-5-(-10)=$ . . . . . (f) $10-(-10)=$ . . . . . .

(g) $10+(-20)=$ . . . . . (h) $310+(-420)=$ . . . . . .

(i) $-310+(-420)=$ . . . . . (j) $(-310)+(-420)=$ . . . . . .

(k) $(-30)+(-20)+(-10)=$ . . . . . (l) $-50-30-20=$ . . . . . .

2. Find the value of

(a) $-5\times-2=$ . . . . . (b) $-5\times(-2)=$ . . . . . .

(c) $6\times-7=$ . . . . . (d) $-5\times9=$ . . . . . .

(e) $-8\times-9\times-1=$ . . . . . (f) $-3\times29=$ . . . . . .

3. Find the value of

(a) $-57\div(-3)=$ . . . . . (b) $12\div-3=$ . . . . . .

(c) $-81\div3=$ . . . . . (d) $12\div(-4)\times(-3)=$ . . . . . .

4. Find the value of

(a) $\dfrac{24}{-3}=$ . . . . . (b) $\dfrac{-24}{-6}=$ . . . . . .

(c) $\dfrac{-72}{-24}=$ . . . . . (d) $\dfrac{-24}{-6}=$ . . . . . .

(e) $\dfrac{19}{-57}=$ . . . . . (f) $\dfrac{-4}{-16}=$ . . . . . .

(g) $\dfrac{-4+6}{-16+8}=$ . . . . . .

5. Work out

(a) $10-2\times5$ (b) $10+2\times5$

. . . . . .

(c) $10-2+4$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(d) $10-4+2$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(e) $10-(4+2)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(f) $60\div 6\times 10$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(g) $60-2\times 10$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(h) $60-12\div(2+1)\times 2$

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(i) $4 \times 5 - 6^2 \div (2+1) \times 2 \times 3$

.....

.....

.....

.....

.....

Answer:.....

6. Work out

(a) $\dfrac{8+4}{8 \times 4}$

.....

.....

.....

Answer:.....

(b) $\dfrac{10+5 \times 2}{5 \div 3} - 1\dfrac{1}{4}$

.....

.....

.....

Answer:.....

7. Work out

(a) $\sqrt{16+9}$

.....

.....

.....

.....

.....

Answer:.....

(b) $\sqrt{3^2+4^2}$

.....

.....

.....

.....

.....

Answer:.....

8. Find the value of

(a) $-10+27 =$ .....

(b) $-5+3 =$ .....

(c) $-5-1 =$ .....

(d) $-15-1 =$ .....

(e) $-35-1 =$ .....

(f) $-5-31 =$ .....

9. How many zeros at the end of $2^{125} \times 5^{200}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

10. How many zeros at the end of $7 \times 119 \times 2^{125} \times 5^{200}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

11. How many zeros at the end of $4^{15} \times 5^{25}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

12. How many zeros at the end of $4^{15} \times 5^{25}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

13. How many zeros at the end of $32 \times 2^3 \times 125^2$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

14. The nth term of a squence is $6n+5$.
Write down the first three terms of this sequence.

. . . . . .

. . . . . .

Answer:.....

15. The nth term of a squence is $6n-5$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

16. The nth term of a squence is $21-4n$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

17. The nth term of a squence is n^2-n+1.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

18. The nth term of a squence is $4n^2+4n+1$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

19. Calculate the following. You must show your working.

(a) $3 \times (8-3) - (4-7) \times 5$

Answer:

(b) $2^10 - (-2)10 \times 1\frac{1}{8}$

Answer:

(c) $1 - (-2)10 \times 1\frac{1}{8}$

Answer:

(d) $\sqrt{3^2+4^2}$

Answer:

2. Algebra

1. x^2+8x can be written in the form $(x+a)^2+b$. Find the value of a and the value of b.

.....

.....

.....

Answer: .....

Answer: .....

2. x^2+7x-3 can be written in the form $(x+a)^2+b$. Find the value of a and the value of b.

.....

.....

.....

Answer: .....

Answer: .....

3. $x^2-6x-10$ is to be written in the form $(x-p)^2+q$. Find the value of p and the value of q.

.....

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. . . . . .

. . . . . .

Answer: .....

Answer: .....

4. $2x^2+5x-10$ is to be written in the form $2(x+p)^2+q$. Find the value of p and the value of q.

. . . . . .

. . . . . .

. . . . . .

Answer: .....

Answer: .....

5. The equation $5-\dfrac{3}{x^2}=-5x-2$ can be written in the form $x^3+ax^2+b=0$. Find the value of a and the value of b.

. . . . . .

. . . . . .

. . . . . .

Answer: .....

Answer: .....

1. Write down the next 3 terms for each sequence:
   (a) 5, 8, 11, 14, ...
   (b) 5, 11, 17, 23, ...
   (c) 1, 3, 6, 10, 15, ...
   (d) 61, 58, 55, 52, ...
   (e) 1, 4, 9, 16, ...
   (f) $\dfrac{1}{2}$, $\dfrac{3}{4}$, $\dfrac{5}{8}$, $\dfrac{7}{16}$, ...
   (g) $x-y$, $x-3y$, $x-5y$, $x-7y$, ...
   (h) 1, 2, 3, 5, 8, 11, ...

2. A sequence begins

   14 17 20 23 26 29

   Write down a formula for the nth term of this sequence.

   .....

   .....

   .....

   .....

   .....

3. A sequence begins

   30 32.5 35 37.5 40 42.5

   Write down a formula for the nth term of this sequence.

   .....

   .....

   .....

   .....

   .....

4. A sequence begins

   60 53 46 39 32 25

   Write down a formula for the nth term of this sequence.

   .....

   .....

   .....

   .....

   .....

1. Expand and simplify.

(a) $(x+9)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(b) $(x+10)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(c) $(x+5)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(d) $(x+12)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

2. Expand and simplify.

(a) $(2x+9)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(b) $(2x+10)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(c) $(3x+5)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(d) $(5x+12)^2$

. . . . . .

. . . . . .

. . . . . .

Answer: . . . . . .

(a) $(a-30)^2$

.....

.....

.....

Answer: .....

(b) $(x-6)^2$

.....

.....

.....

Answer: .....

(c) $(m-5)^2$

.....

.....

.....

Answer: .....

(d) $(n-1)^2$

.....

.....

.....

Answer: .....

3. Expand and simplify.

(a) $(a+5)(a-5)$

.....

.....

.....

Answer: .....

(b) $(b+6)(b-6)$

.....

.....

.....

Answer: .....

(c) $(x-10)(x+10)$

.....

.....

.....

Answer: .....

(d) $(m-15)(m+15)$

.....

.....

.....

Answer: .....

4. Expand and simplify.

(a) $(x+5y)^2$

.....

.....

.....

Answer: .....

(b) $(5x+6y)^2$

.....

.....

.....

Answer: .....

(c) $(3x+16y)^2$

.....

.....

.....

Answer: .....

(d) $(5x+15y)^2$

.....

.....

.....

Answer: .....

5. Expand and simplify.

(a) $(5m+2n)^2$

.....

.....

.....

Answer: .....

(b) $(8a+7b)^2$

.....

.....

.....

Answer: .....

(c) $(3p+7q)^2$

.....

.....

.....

Answer: .....

(d) $(5c+9d)^2$

.....

.....

.....

Answer: .....

6. Expand and simplify.

(a) $(7a-3b)^2$

.....

.....

.....

Answer: .....

(b) $(5x-6y)^2$

.....

.....

.....

Answer: .....

(c) $(3x-11y)^2$

.....

.....

.....

Answer: .....

(d) $(5m+13n)^2$

.....

.....

.....

Answer: .....

7. Expand and simplify.

(a) $(5a-2b)^2$

.....

.....

.....

Answer: .....

(b) $(8m-7n)^2$

.....

.....

.....

Answer: .....

(c) $(3c-8d)^2$

.....

.....

.....

Answer: .....

(d) $(5x-9y)^2$

.....

.....

.....

Answer: .....

8. Expand and simplify.

(a) $(8+a)(a-8)$

.....

.....

.....

Answer: .....

(b) $(b+6)(6-b)$

.....

.....

.....

Answer: .....

(c) $(10-x)(x+10)$

.....

.....

.....

Answer: .....

(d) $(m-20)(20+m)$

.....

.....

.....

Answer: .....

9. Show that $\frac{(x-8)^2}{4} - 25$ is same as $\frac{(x-18)(x+2)}{4}$
10. Factorise these quadratic expressions.

(a) $x^2 - 5x$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(b) $x^2 - 5x + 6$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(c) $x^2 - 5x - 6$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(d) $x^2 + 5x - 6$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(e) $x^2 - 6x + 8$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(f) $x^2 + 6x + 8$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(g) $x^2 + 8x + 15$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(h) $x^2 - 4x - 32$

. . . . . .
. . . . . .
. . . . . .

Answer: .....

(i) $x^2 - 16$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(j) $x^2 - 16y^2$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(k) $4x^2 - 16$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(l) $25x^2 - 9y^2$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(m) $2x^2 - 50$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

11. Write as a single fraction.

(a) $\frac{1}{x} - x$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(b) $\frac{1}{x} - \frac{x}{2}$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(c) $\dfrac{1}{x+1}-\dfrac{x-2}{x^2+x}$

.....

.....

.....

Answer: .....

(d) $\dfrac{1}{x+1}-\dfrac{x}{x^2-1}$

.....

.....

.....

Answer: .....

(e) $\dfrac{3}{2(x+7)}-\dfrac{x+8}{x^2-49}$

1. Solve the following equations.

(a) $(x-5)(2x+5)=0$

.....

.....

.....

Answer:.....

(b) $x(3x-6)=0$

.....

.....

.....

Answer:.....

(c) $(3x-1)(x+7)=0$

.....

.....

.....

Answer:.....

(d) $(4x-1)(x-2)=0$

.....

.....

.....

Answer:.....

(e) $(x+1)(x+2)=0$

.....

.....

.....

Answer:.....

(f) $(x-10)(x-12)=0$

1. Solve the equation $\frac{1}{x-5}-\frac{2}{2x+5}=\frac{3}{3x-5}$.
2. aaa aa

1. Solve, for real values of x , the inequality

$$|2x-10| \leqslant x+5$$

.....

.....

.....

.....

.....

Answer:.....

2. Solve, for real values of x , the inequality

$$\frac{3x+4}{2-x} \leqslant 7$$

.....

.....

.....

.....

.....

Answer:.....

3. Showing all your working, find the square root(s) of the complex number $z = 3-4i$.

.....

.....

.....

.....

.....

Answer:.....

4. Let $F_n(x) = \int cos^n x\, dx$.

By rewriting $cos^n x$ as $cosx\, cos^{n-1} x$ or otherwise, prove that

$$F_n(x) = \frac{1}{n} cos^{n-1} x\, sinx + \left(\frac{n-1}{n}\right) F_{n-2}(x)$$

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Answer:

5. Find all solutions $(3+2\sqrt{2})^{x^2-4x+3}+(3-2\sqrt{2})^{x^2-4x+3}=6$, expressing your answer in exact form.

Answer:

3. Geometry

IGCSE Cambridge International Mathematics 0607, ISBN 978-1-921500-04-6, page 263

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1. Find the coordinates of the midpoint of the line segment joining the pairs of points:

(1) $(6,8)$ *and* $(18,10)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(2) $(10,-22)$ *and* $(-18,-32)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(3) $(50,-32)$ *and* $(-70,-102)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(4) $(65,0)$ *and* $(61,-32)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(5) $(1\frac{4}{5},-2\frac{3}{7})$ *and* $(-2\frac{3}{4},-32\frac{1}{11})$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

2. *AB* is the diameter of a circle with centre *P*. If *A* is (-24, 32) and *B* is (46, 28), find the coordinates of *P*.

. . . . . .

. . . . . .

. . . . . .

Answer: .....

Example The equation $5-\dfrac{3}{x^2}=-5x-2$ can be written in the form $x^3+ax^2+b=0$. Find the value of a and the value of b.

Solution:

$$5-\frac{3}{x^2}=-5x-2$$

Multiply by x^2

$$5x^2-3=-5x^3-2x^2$$

Rearranging

$$5x^3+7x^2-3=0$$

Note:

Above is one common error in solving absolute value inequlities as

$$|a|\geqslant b \not\Rightarrow a^2\geqslant b^2 \qquad \text{if b is negative.}$$

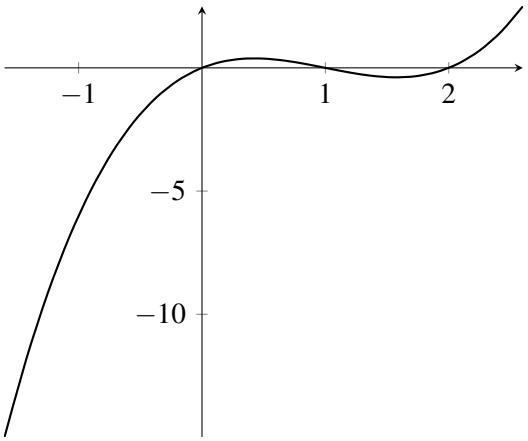
For example, $x=0$ is a valid value in the above inequality but

$$|0|\geqslant -10 \not\Rightarrow 0^2\geqslant (-10)^2$$

Introduction

- ❏ *Definition of Theorem*
- ❏ *Ask for help*
- ❏ *Optimization Problem*
- ❏ *Property of Cauchy Series*
- ❏ *Angle of Corner*

0000abcd1230000



Pure Mathematics 2 and 3 by Sophie Goldie, ISBN 978-1-144441-4646-2, page 124

abcd123

Pure Mathematics 2 an

Skill: Rearranging Formulae

Rearrange the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ to make f the subject of the formula.

Solution:

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{f} = \frac{u}{uv} + \frac{v}{uv} \quad \text{; Rearranging}$$

$$\frac{1}{f} = \frac{u+v}{uv} \quad \text{; Write as a simple fraction}$$

$$\frac{f}{1} = \frac{uv}{u+v}$$

$$f = \frac{uv}{u+v} \quad \text{;Reciprocal}$$

Skill: Rearranging Formulae

Rearrange the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ to make f the subject of the formula.

Solution:

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\frac{1}{f} = \frac{u}{uv} + \frac{v}{uv} \quad \text{; Rearranging}$$

$$\frac{1}{f} = \frac{u+v}{uv} \quad \text{; Write as a simple fraction}$$

$$\frac{f}{1} = \frac{uv}{u+v}$$

$$f = \frac{uv}{u+v} \quad \text{;Reciprocal}$$

Mathematics and Statistics Year 8
Algebra

Elite Education Centre

Instructions

- Without sufficient working, correct answers may be awarded no marks.
- Calculators must not be used.
- If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.

Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

1. x^2+8x can be written in the form $(x+a)^2+b$. Find the value of a and the value of b.

.....

.....

.....

Answer:.....

Answer:.....

2. x^2+7x-3 can be written in the form $(x+a)^2+b$. Find the value of a and the value of b.

.....

.....

.....

Answer:.....

Answer:.....

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3. $x^2-6x-10$ is to be written in the form $(x-p)^2+q$. Find the value of p and the value of q.

Answer:

Answer:

4. $2x^2+5x-10$ is to be written in the form $2(x+p)^2+q$. Find the value of p and the value of q.

Answer:

Answer:

5. The equation $5-\dfrac{3}{x^2}=-5x-2$ can be written in the form $x^3+ax^2+b=0$. Find the value of a and the value of b.

Answer:

Answer:

Skill: Rearranging Formulae Check2

Algebra	One	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$ aaaa bbbb aaa	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	a $\frac{a}{\frac{a^2}{aaa^2+b^2}}$ b c	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	One	Two
Algebra	One	Two

Algebra check1

Algebra	One	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$ aaaa bbbb aaa	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	a $\frac{a}{\frac{a^2}{aaa^2+b^2}}$ b c	Two
Algebra	$\frac{a}{\frac{a^2}{aaa^2+b^2}}$	Two
Algebra	One	Two
Algebra	One	Two

My table					
Group	One	Two	Three	Four	Sum
Red	1000.00	2000.00	3000.00	4000.00	10000.00
Green	2000.00	3000.00	4000.00	5000.00	14000.00
Blue	3000.00	4000.00	5000.00	6000.00	18000.00
Sum	6000.00	9000.00	12000.00	15000.00	42000.00

a

123456789

Example: Solve the inequality $|x| \geqslant 2x - 10$.

$|x| \geqslant 2x - 10$
$(x)^2 \geqslant (2x-10)^2$ ..... Incorrect
...
...

Note:

Above is one common error in solving absolute value inequlities as

$$|a| \geqslant b \not\Rightarrow a^2 \geqslant b^2 \qquad \text{if b is negative.}$$

For example, $x = 0$ is a valid value in the above inequality but

$$|0| \geqslant -10 \not\Rightarrow 0^2 \geqslant (-10)^2$$

$a^2 + b^2 = c^2$

$a^2 + b^2 = c^2$

$a^2 + b^2 = c^2$

$a^2 + b^2 = c^2$

$a^2 + b^2 = c^2$

$a^2 + b^2 = c^2$

Factorising

KeyFind

$a^2+b^2=c^2$

$a^2+b^2=c^2$

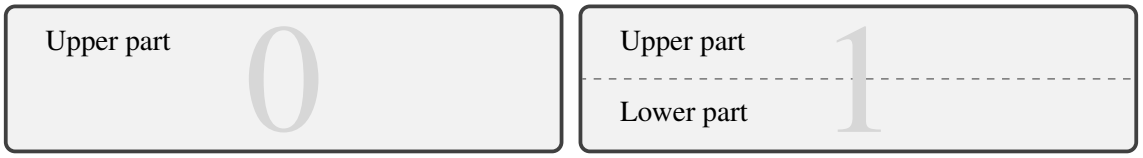
$a^2+b^2=c^2$

$a^2+b^2=c^2$

$a^2+b^2=c^2$

$a^2+b^2=c^2$

	Distribution	Hits
1	Mint	2364
2	Ubuntu	1838
3	Debian	1582
4	openSUSE	1334
4	openSUSE	1334
5	Fedora	1262
6	Mageia	1219
7	CentOS	1171
8	Arch	1040
9	elementary	899
10	Zorin	851


Upper part
0
Upper part
Lower part
1

Every line is inside an equal height group:

Box 1

First 1111 line
second line

$|x| \geqslant 2x - 10$
$(x)^2 \geqslant (2x - 10)^2$
. . . . . Incorrect
. . .
. . .

Note:

Above is one common error in solving absolute value inequlities as

$|a| \geqslant b \not\Rightarrow a^2 \geqslant b^2$ if b is negative.

For example, $x = 0$ is a valid value in the above inequality but

$$|0| \geqslant -10 \not\Rightarrow 0^2 \geqslant (-10)^2$$

The height of this box rules.

Box 2

Test

Box 3

First line
second line

Box 4

The height of this box rules.

tolorbox ABC 1

Example: Solve the inequality $|x| \geqslant 2x - 10$.

$|x| \geqslant 2x - 10$
$(x)^2 \geqslant (2x - 10)^2$
. . . . . Incorrect
. . .
. . .

Note:

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For example, $x = 0$ is a valid value in the above inequality but

$$|0| \geqslant -10 \not\Rightarrow 0^2 \geqslant (-10)^2$$

tolorbox ABC 2

ddddd

ddd
Example 1111111 : Solve
the inequality
$|x| \geqslant 2x - 10$.
$\frac{1}{1+3}$

tolorbox ABC 3

ccccc
ddd

tolorbox ABC 4

aaa

E 11111111111very line is inside an equal height group:

Box 1

First line
second line
The height of this box rules.

Box 2

Test

Box 3

First line
second line

Box 4

The height of this box rules.

Example: Solve the inequality $|x| \geqslant 2x - 10$.

$|x| \geqslant 2x - 10$
$(x)^2 \geqslant (2x - 10)^2$
. . . . . Incorrect
. . .
. . .

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This is my content.

This is my content.

More content.

My title

This is my content.

My title

This is my content.

More content.

Testing..... 123456

Skill 1 Factorising

aaaaaaaaa a search123 $\frac{\frac{1}{2}}{\frac{3}{4}}$=

1. Work out

   (a) $-5+3=$ aaaa

   (b) $-5+sdsdsdssdd3232233=$ aaaa

   (c) $-5+23222323232233=$ aaaa

   (d) $-5+3111=$

   (e) $-5+3111=$

   (f) $-5+3111=$

   (g) $-5+3111=$

   (h) $-5+10=$ . . . . . .

   (i) $-5-3=$ . . . . . .

   (j) $-5+1=$ . . . . . .

   (k) $-5-(-10)=$ . . . . . .

   (l) $10-(-10)=$ . . . . . .

   (m) $10+(-20)=$ . . . . . .

   (n) $310+(-420)=$ . . . . . .

   (o) $-310+(-420)=$ . . . . . .

   (p) $(-310)+(-420)=$ . . . . . .

   (q) $(-30)+(-20)+(-10)=$ . . . . . .

   (r) $-50-30-20=$ . . . . . .

2. Find the value of

   (a) $-5\times-2=$ . . . . . .

   (b) $-5\times(-2)=$ . . . . . .

   (c) $6\times-7=$ . . . . . .

   (d) $-5\times9=$ . . . . . .

   (e) $-8\times-9\times-1=$ . . . . . .

   (f) $-3\times29=$ . . . . . .

3. Find the value of

   (a) $-57\div(-3)=$ . . . . . .

   (b) $12\div-3=$ . . . . . .

   (c) $-81\div3=$ . . . . . .

   (d) $12\div(-4)\times(-3)=$ . . . . . .

4. Find the value of

   (a) $\frac{24}{-3}=$ . . . . . .

   (b) $\frac{-24}{-6}=$ . . . . . .

   (c) $\frac{-72}{-24}=$ . . . . . .

   (d) $\frac{-24}{-6}=$ . . . . . .

   (e) $\frac{19}{-57}=$ . . . . . .

   (f) $\frac{-4}{-16}=$ . . . . . .

   (g) $\frac{-4+6}{-16+8}=$ . . . . . .

5. Work out

(a) $10-2\times5$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(b) $10+2\times5$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(c) $10-2+4$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(d) $10-4+2$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(e) $10-(4+2)$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(f) $60\div6\times10$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(g) $60-2\times10$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(h) $60-12\div(2+1)\times2$

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(i) $4 \times 5 - 6^2 \div (2+1) \times 2 \times 3$

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Answer: .....

6. Work out

(a) $\dfrac{8+4}{8 \times 4}$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(b) $\dfrac{10+5 \times 2}{5 \div 3} - 1\dfrac{1}{4}$

. . . . . .

. . . . . .

. . . . . .

Answer: .....

7. Work out

(a) $\sqrt{16+9}$

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Answer: .....

(b) $\sqrt{3^2+4^2}$

. . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Answer: .....

8. Find the value of

(a) $-10+27 =$ . . . . . .

(b) $-5+3 =$ . . . . . .

(c) $-5-1 =$ . . . . . .

(d) $-15-1 =$ . . . . . .

(e) $-35-1 =$ . . . . . .

(f) $-5-31 =$ . . . . . .

9. How many zeros at the end of $2^{125} \times 5^{200}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

10. How many zeros at the end of $7 \times 119 \times 2^{125} \times 5^{200}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

11. How many zeros at the end of $4^{15} \times 5^{25}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

12. How many zeros at the end of $4^{15} \times 5^{25}$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

13. How many zeros at the end of $32 \times 2^3 \times 125^2$? Show your working clearly.

. . . . . .

. . . . . .

Answer: .....

14. The nth term of a squence is $6n+5$.
Write down the first three terms of this sequence.

. . . . . .

. . . . . .

Answer:.....

15. The nth term of a squence is $6n-5$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

16. The nth term of a squence is $21-4n$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

17. The nth term of a squence is n^2-n+1.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

18. The nth term of a squence is $4n^2+4n+1$.
Write down the first three terms of this sequence.

.....

.....

Answer:.....

19. Calculate the following. You must show your working.

(a) $3 \times (8-3) - (4-7) \times 5$

.....

.....

.....

.....

.....

Answer:.....

(b) $2^10 - (-2)10 \times 1\frac{1}{8}$

.....

.....

.....

.....

.....

Answer:.....

(c) $1 - (-2)10 \times 1\frac{1}{8}$

.....

.....

.....

.....

.....

Answer:.....

(d) $\sqrt{3^2+4^2}$

.....

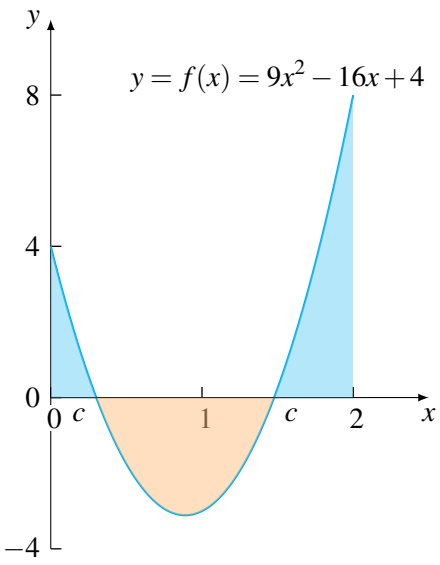
.....

.....

.....

.....

Answer:.....


y
8
4
0
−4
0
c
1
c
2
x
y = f(x) = 9x² − 16x + 4

4. Test

Theorem 0.1: Pythagoras' theorem

In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the catheti.

$$a^2 + b^2 = c^2$$

In mathematics, the Pythagorean theorem, also known as Pythagoras' theorem (see theorem 0.1), is a relation in Euclidean geometry among the three sides of a right triangle.

Ban box.

A

Ban environment.
Lorem ipsum dolor sit amet.
Earum odit quia maiores nisi illum reiciendis aspernatur.

B

Warning box.

C *aaax* = $x+1$ Warning environment.
Lorem 000000000000000000 ipsum dolor sit amet
Earum odit quia maiores nisi illum reiciendis aspernatur.

D