

**'All students can achieve
any grade or understand
any concept with the right teacher'
Sayed Ali**

- * Follow [@mathsuk](#)
 - * $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 - * $a^2 = b^2 + c^2 - 2bc \cos A$
 - * $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$
- $2\pi r = C$
 $y(x) = x^3$
 $\pi r^2 = A$
 $\tan x = \frac{\sin x}{\cos x}$

The quadratic formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

for any equation in the form

$$ax^2 + bx + c = 0$$

Squared

$$0^2 = 0$$

$$1^2 = 1$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

$$5^2 = 25$$

$$6^2 = 36$$

$$7^2 = 49$$

$$8^2 = 64$$

$$9^2 = 81$$

$$10^2 = 100$$

$$11^2 = 121$$

$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

Cubed

$$0^3 = 0$$

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

$$7^3 = 343$$

$$8^3 = 512$$

$$9^3 = 729$$

$$10^3 = 1000$$

$$0^2 = 0 \times 0 = 0$$

$$1^2 = 1 \times 1 = 1$$

$$2^2 = 2 \times 2 = 4$$

$$3^2 = 3 \times 3 = 9$$

$$4^2 = 4 \times 4 = 16$$

$$5^2 = 5 \times 5 = 25$$

$$6^2 = 6 \times 6 = 36$$

$$7^2 = 7 \times 7 = 49$$

$$8^2 = 8 \times 8 = 64$$

$$9^2 = 9 \times 9 = 81$$

$$10^2 = 10 \times 10 = 100$$

$$11^2 = 121$$

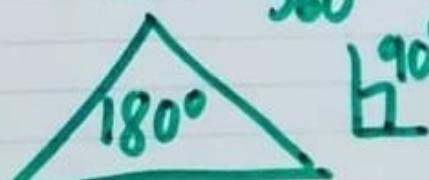
$$12^2 = 144$$

$$13^2 = 169$$

$$14^2 = 196$$

$$15^2 = 225$$

360° Circle has 360°



Squared Numbers

$$0^3 = 0 \times 0 \times 0 = 0$$

$$1^3 = 1 \times 1 \times 1 = 1$$

$$2^3 = 2 \times 2 \times 2 = 8$$

$$3^3 = 3 \times 3 \times 3 = 27$$

$$4^3 = 4 \times 4 \times 4 = 64$$

$$5^3 = 5 \times 5 \times 5 = 125$$

$$6^3 = 6 \times 6 \times 6 = 216$$

$$7^3 = 7 \times 7 \times 7 = 343$$

$$8^3 = 8 \times 8 \times 8 = 512$$

$$9^3 = 9 \times 9 \times 9 = 729$$

$$10^3 = 10 \times 10 \times 10 = 1000$$

Cubed Numbers

$$0^3 = 0$$

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

$$7^3 = 343$$

$$8^3 = 512$$

$$9^3 = 729$$

$$10^3 = 1000$$

$$25^2 = 625$$

$$35^2 = 1225$$

$$45^2 = 2025$$

$$55^2 = 3025$$

$$65^2 = 4225$$

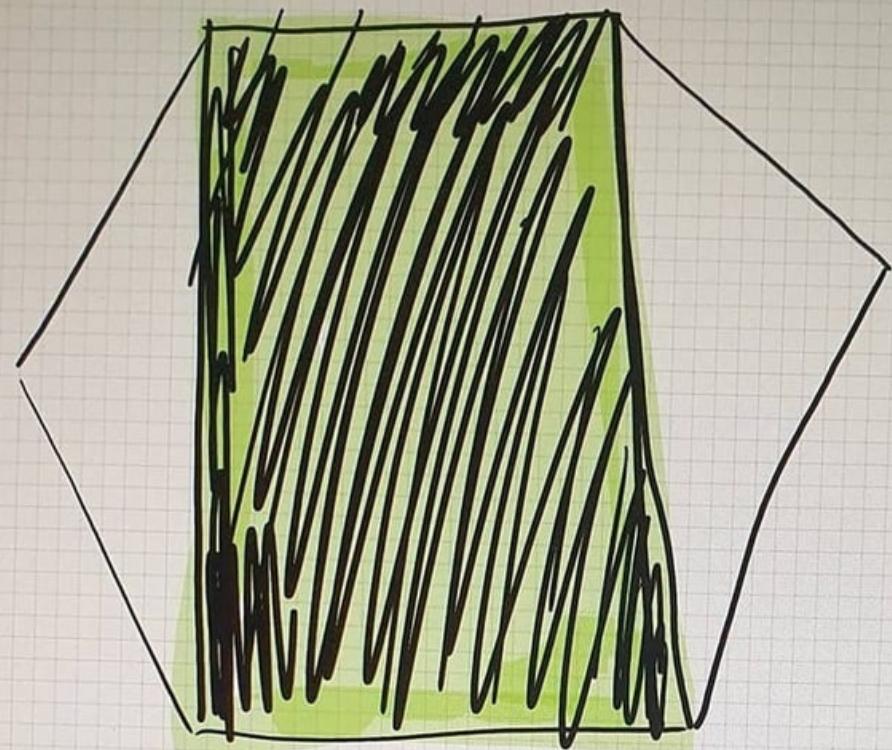
$$75^2 = 5625$$

$$85^2 = 7225$$

$$95^2 = 9025$$

$$105^2 = 11025$$

What fraction of the Shape is Shaded



(Not drawn
to scale)

Hexagon

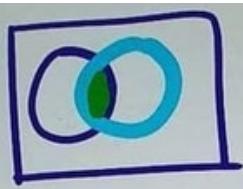
@mathSuk

Quadratic Graphs

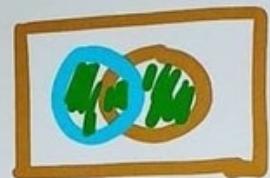
$$x^2 = \text{Smile}$$

$$-x^2 = \text{Sad}$$

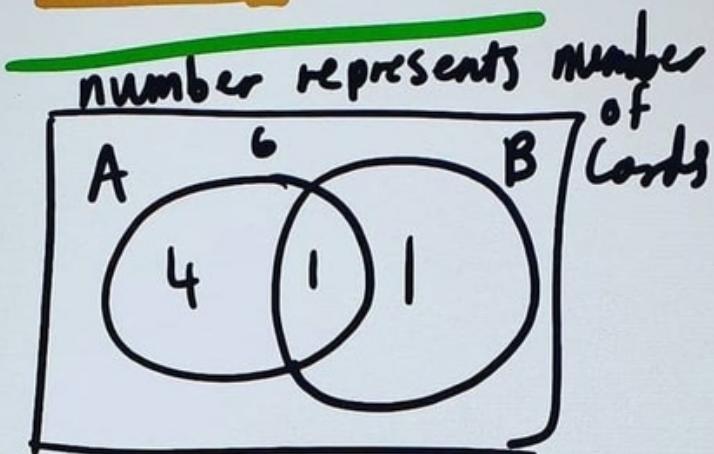
follow
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for
maths
tutoring



$$I = A \cap B$$



$$A \cup B$$



$$P(A \cup B) = \frac{6}{12} \quad P(A) = \frac{5}{12}$$

$$P(A') = \frac{7}{12} \quad P(B) = \frac{2}{12}$$

$$P(A \cap B) = \frac{1}{12} \quad P(B') = \frac{10}{12}$$

$$P(A \cap B)' = \frac{11}{12} \quad P(A' \cap B) = \frac{1}{12}$$

% Tricks

$$\begin{array}{rcl} 70\% & \text{of} & 90 = \\ \downarrow \div 10 & \downarrow & \downarrow \div 10 \\ 7 & \times & 9 = 63 \end{array}$$
$$\begin{array}{rcl} 60\% & \text{of} & 35 = \\ \downarrow \div 10 & \downarrow & \downarrow \div 10 \\ 6 & \times & 3.5 = 21 \end{array}$$

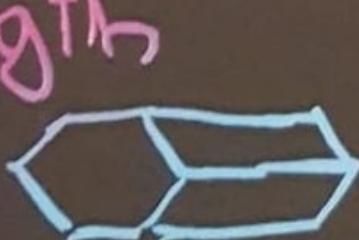
Use this method for 80% of 190
Follow @mathsuk

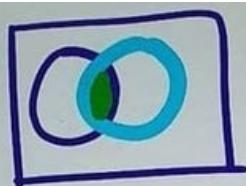
$$25^2 = 625$$

$$2 \times 3 = 6$$

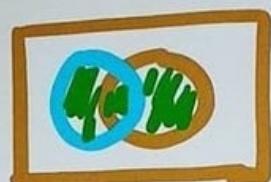
$$35^2 =$$

- area of a circle = πr^2
- circumference of a circle = $2\pi r$
- equation of a circle = $x^2 + y^2 = r^2$
 - * r = radius
- equation of a line = $y = mx + c$
 - m = gradient c = y intercept
- volume of a cylinder = $h \times \pi r^2$
- cross-sectional area of a cylinder = $2\pi r^2 + (2\pi r \times h)$
- volume of a sphere = $\frac{4}{3} \pi r^3$
- volume of a triangular prism
 $= \frac{1}{2} ab \sin C \times \text{length}$
- volume of a hexagonal prism
 $= 3ab \sin C \times \text{length}$

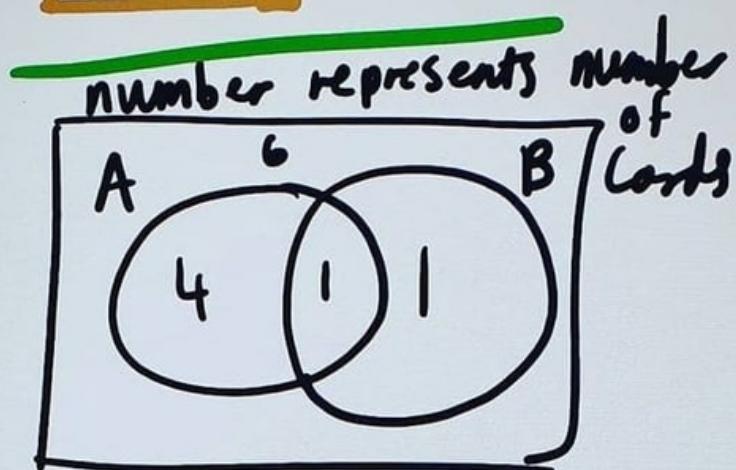




$$I = A \cap B$$



$$A \cup B$$



$$P(A \cup B) = \frac{6}{12} \quad P(A) = \frac{5}{12}$$

$$P(A') = \frac{7}{12} \quad P(B) = \frac{3}{12}$$

$$P(A \cap B) = \frac{1}{12} \quad P(B') = \frac{10}{12}$$

$$P(A \cap B)' = \frac{11}{12} \quad P(A' \cap B) = \frac{1}{12}$$

$$(1y)^3 = 1y^3$$

$$(2y)^3 = 8y^3$$

$$(3y)^3 = 27y^3$$

$$(4y)^3 = 64y^3$$

$$(5y)^3 = 125y^3$$

$$(6y)^3 = 216y^3$$

$$(7y)^3 = 343y^3$$

$$(8y)^3 = 512y^3$$

$$(9y)^3 = 729y^3$$

$$(10y)^3 = 1000y^3$$

$$(11y)^3 = 1331y^3$$

$$(12y)^3 = 1728y^3$$

$$(13y)^3 = 2197y^3$$

$$(14y)^3 = 2744y^3$$

$$(15y)^3 = 3375y^3$$

$$(16y)^3 = 4096y^3$$

$$(17y)^3 = 4913y^3$$

$$(18y)^3 = 5832y^3$$

$$(19y)^3 = 6859y^3$$

$$(20y)^3 = 8000y^3$$

$$x^a \times x^b = x^{a+b}$$

$$x^a \div x^b = x^{a-b}$$

$$(x^a)^b = x^{ab}$$

$$x^{-a} = \frac{1}{x^a}$$

$$x^{\frac{a}{b}} = (\sqrt[b]{x})^a$$

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

$$2^{2x} = 4^{3x-1}$$

$$2^{2x} = 2^{3x-1}$$

$$\cancel{2^x} = \cancel{2^{3x-1}}$$
$$-3x -3x$$

$$-2x = -1$$

$$2x = 1$$

$$x = 1/2$$

Factorise :

Completing
the
Square

$$\left. \begin{array}{l} x^2 + 6x + 2 = 0 \\ (x+3)^2 - (3)^2 + 2 = 0 \\ (x+3)^2 - 9 + 2 = 0 \\ (x+3)^2 - 7 = 0 \end{array} \right\}$$

grade 8

Follow

@mathsuk

Solve:

$$\left. \begin{array}{l} (x+3)^2 - 7 = 0 \\ (x+3)^2 = 7 \\ (x+3) = \pm \sqrt{7} \\ x = -3 \pm \sqrt{7} \end{array} \right\}$$

$$3^x = 27\sqrt{3}$$

$$3^x = 3^3 \cdot 3^{\frac{1}{2}}$$

$$3^x = 3^{3.5}$$

$$\text{So } x = 3.5$$

$$1) x^5 \cdot x^7 = x^{12}$$

$$2) x^2 \cdot x^4 = x^6$$

$$3) x^8 \div x^2 = x^6$$

$$4) x^{10} \div x^4 = x^6$$

$$5) x^{11} \div x^5 = x^6$$

$$6) x^9 \div x^2 = x^7$$

$$7) x^{12} \div x^7 = x^5$$

$$8) x^{20} \div x^{10} = x^{10}$$

$$9) x^{100} \div x^{20} = x^{80}$$

$$10) x^{200} \div x^{20} = x^{180}$$

$$3x + 4(6 - 2x) + 11 = 0$$

$$3x + 24 - 8x + 11 = 0$$

$$-5x + 35 = 0$$

$$35 = 5x$$

$$\frac{35}{5} = x$$

$$x = 7$$

$$y = 6 - 2(7)$$

$$y = 6 - 14 = -8$$

$$\text{So } (7, -8)$$

M1

$$\frac{\sqrt{x^2}}{\sqrt[3]{x^3}} = \underline{x}$$

M2

$$\begin{aligned} \left(\frac{x^2}{x^3}\right)^{\frac{1}{2}} &= x^1 = \underline{x} \\ \left(x^3\right)^{\frac{1}{3}} &= x^1 = x \end{aligned}$$

Solve

$$\sqrt{3^2 + 4^2} = \sqrt{8|x^2|}$$

$$5 = 9x$$

$$x = \frac{5}{9}$$

$$\sqrt{6^2 + 8^2} = \sqrt[3]{8x^3}$$

$$\begin{aligned} 10 &= 2x \\ x &= 5 \end{aligned}$$

$$\sqrt{3^2 + 4^2} = \sqrt[3]{125x^3}$$

$$5 = 5x$$

$$x = 1 \checkmark$$

für x mit:

$$8x^2 - x = x(8x - 1)$$

$$9x^2 - x = x(9x - 1)$$

99-

$$2x^2 + 8x + 17 \quad (\text{ts})$$

$$2 \left[x^2 + 4x + \frac{17}{2} \right]$$

$$2 \left[(x+2)^2 + \frac{9}{2} \right]$$
$$2(x+2)^2 + 9$$

turing point $(-2, 9)$

$$\begin{aligned} & (x+2)^2 - (2)^2 + \frac{17}{2} \\ & (x+2)^2 - \frac{4}{1x2} + \frac{17}{2} \\ & (x+2)^2 + \frac{9}{2} \end{aligned}$$

R SA

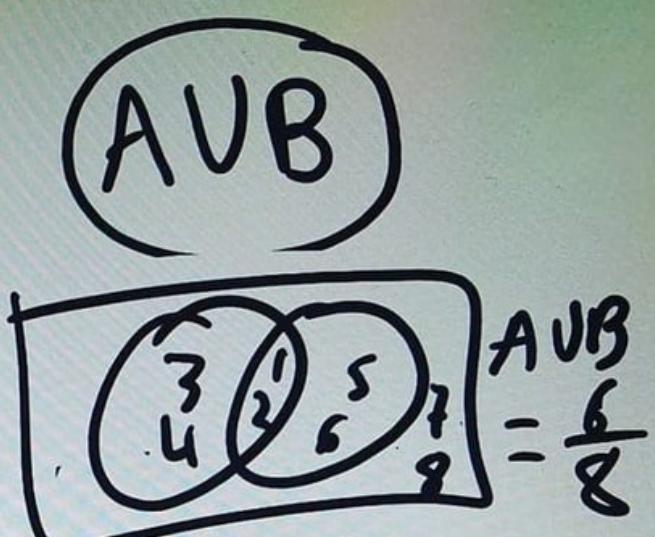
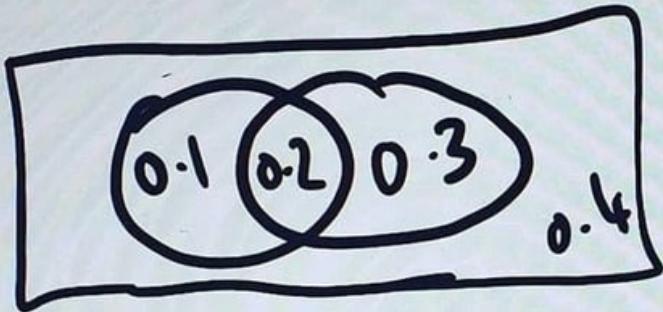
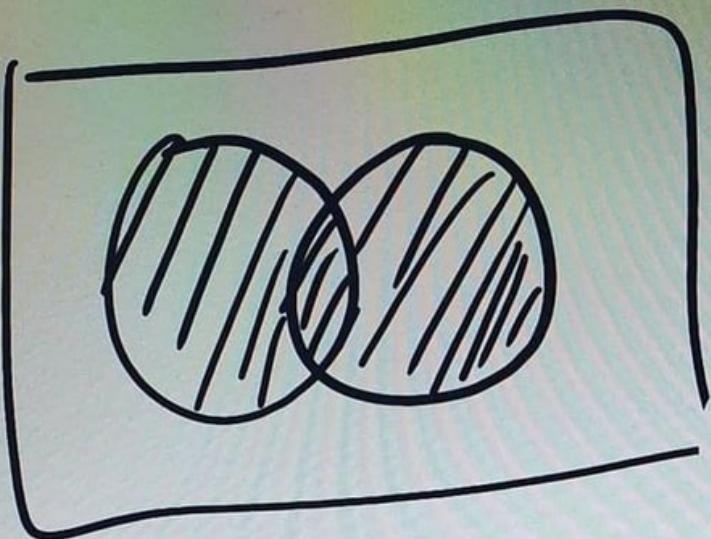
Solve:

$$x^2 - 18x = 0$$

$$(x)(x-18) = 0$$

$$x = 0 \quad \text{or} \quad x - 18 = 0$$

$$x = 18$$



$$P(A \cup B) = 0.6$$

$$P(A \cap B) = 0.2$$

Example to explain

Factorise

$$2x^2 + 5x + 2$$

hard factoring

$$\begin{array}{r} \times \\ 4 \\ \hline +1 +4 \\ 2 2 \end{array}$$

$$2x^2 + 1x + 4x + 2$$
$$1x(2x+1) + 2(2x+1)$$

$$\rightarrow (2x+1)(x+2)$$

factorise

$$4x^2 - \underline{100} = 4(x^2 - 25)$$
$$= 4(x+5)(x-5)$$

$$3x^2 - 27 = 3(x-3)(x+3)$$

$$5(2x+3) = 10x+15$$

$$3(2x-5) = 6x-15$$

$$5(6x+2) = 30x+10$$

$$2(5x-6) = 10x-12$$

$$4(5x-10) = 20x-40$$

$$5(3x+7) = 15x+35$$

$$7(5x+5) = 35x+35$$

$$9(8x+10) = 72x+90$$

$$5(2x^2+5x) = 10x^2+25x$$

$$7(3x^2+6x) = 21x^2+42x$$

Expand

$$5(9x^2+8x) = 45x^2+40x$$

$$10(3x^2+5x) = 30x^2+50x$$

$$7(7x^2+8x) = 49x^2+56x$$

$$4(5x^2+9x) =$$

$$\frac{5(x+1)}{7} = 13$$

Expand { $5(x+1) = 91$

$$5x + 5 = 91$$

$$5x = 86$$

$$x = \frac{86}{5}$$

follow @mathsukt

Bodmas / Numbers

Integer = 1, 2, 3, 69, -3, 0

Non integer = $0.7, \frac{1}{5}, \sqrt{7}, \sqrt{101}, 7\frac{3}{4}, \pi,$

$$\frac{1}{3} = 0.33\dot{3}$$

$$\frac{2}{3} = 0.66\dot{6}$$

Find the value of

$$\sqrt{5 \times 7 + 1}$$

$$\sqrt{35 + 1}$$

$$\sqrt{36} = 6$$

Find the reciprocal

$$6 \Rightarrow \frac{1}{6}$$

$$g(x) = 25 - x^2$$

$$g(9) = 25 - (9)^2 = 25 - 81 \\ = 56$$

Algebra

$$z + z = 2z$$

$$y + 2y = 3y$$

$$5x + 8x = 13x$$

$$9x - 4x = 5x$$

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

$$6y^2 + 4y^2 = 10y^2$$

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

$$9y^2 - 4y^2 =$$

Factorise

$$1) 9\underline{x^2} - 1 = (3x + 1)(3x - 1)$$

$$2) 4x^2 - 25 = (2x + 5)(2x - 5)$$

$$3) 7 - x^2 = (\sqrt{7} + x)(\sqrt{7} - x)$$

$$g(x) = \underline{25 - x^2}$$

Solve $\underline{g(x)} = \underline{0}$

$$25 - x^2 = 0$$

$$\begin{aligned} 25 &= x^2 \\ x &= \pm 5 \end{aligned}$$

$$(x+2)(3x-1)(x+4)$$

$$3x^2 - 1x + 6x - 2$$

$$(3x^2 + 5x - 2) \cancel{(x+4)}$$

$$\begin{array}{r} 3x^3 + 5x^2 - 2x + \underline{12x^2 + 20x - 8} \\ \hline 3x^3 + \underline{17x^2 + 18x - 8} \end{array}$$

(Total for Question 4 is 2 marks)

Work out the number of green pens in the box.

b and b or g and g = $\frac{27}{55}$

$$\frac{x+3}{2x+3} \times \frac{x+2}{2x+2} + \frac{x}{2x+3} \times \frac{x-1}{2x+2} = \frac{27}{55}$$
$$\left\{ \begin{array}{l} \frac{x^2+5x+6}{4x^2+10x+6} + \frac{x^2-x}{4x^2+10x+6} = \frac{27}{55} \\ \frac{2x^2+4x+6}{4x^2+10x+6} = \frac{27}{55} \end{array} \right.$$

$110x^2 + 220x + 330 = 108x^2 + 270x + 162$
(move all to one side)
 $2x^2 - 50x + 168 = 0$
 $x^2 - 25x + 84 = 0$
 $(x-21)(x-4) = 0$
Solution:
 $x = 21$ or $x = 4$

$$(3 + \sqrt{5})^2 = (3 + \sqrt{5})(3 + \sqrt{5})$$

$$= 9 + 3\sqrt{5} + 3\sqrt{5} + 5$$

$$= 9 + 6\sqrt{5} + 5 = 14 + 6\sqrt{5}$$

Diameter = midpoint, centre
find them!

$$(-3, 8) \quad (5, 4)$$
$$x_1 \quad y_1 \qquad x_2 \quad y_2$$

$$\frac{-3 + 5}{2}, \quad \frac{8 + 4}{2}$$

$$\frac{2}{2}, \quad \frac{12}{2}$$

$$(1, 6)$$

$$a = \frac{3c - 4}{c + 5} \quad c = ?$$

$$a(c + 5) = 3c - 4$$

$$ac + 5a = 3c - 4$$

$$ac - 3c = -5a - 4$$

$$c(a - 3) = -5a - 4$$

$$\therefore c = \frac{-5a - 4}{a - 3}$$

grade 9 @mathsukt

$$f(x) = \frac{x+10}{x-10}$$

$$f^{-1}(x) = ?$$

$$f^{-1}(5x^2) = ?$$

$$f^{-1}(x) = \frac{10(x+1)}{x-1}$$

$$\begin{aligned} f^{-1}(5x^2) &= \frac{10(5x^2+1)}{(5x^2)-1} \\ &= \frac{50x^2+10}{5x^2-1} \end{aligned}$$



Solution

$$y = \frac{x+10}{x-10}$$

$$x = \frac{y+10}{y-10} \quad \left. \begin{matrix} y=? \end{matrix} \right\}$$

$$x(y-10) = y + 10$$

$$xy - 10x = y + 10 \quad \left. \begin{matrix} \text{move all } y \text{ to one side} \\ y \end{matrix} \right\}$$

$$xy - y = 10x + 10$$

$$y(x-1) = 10x + 10$$

$$y = \frac{10x+10}{x-1}$$

@mathentk

Solve grade 9

$$25^{3x+5} \times 125^{2x-7} = 5^{3x-1}$$

$$(5^2)^{3x+5} \times (5^3)^{2x-7} = 5^{3x-1}$$

$$5^{6x+10} \times 5^{6x-21} = 5^{3x-1}$$

$$5^{12x-11} = 5^{3x-1}$$

$$12x - 11 = 3x - 1$$

$$9x - 11 = -1$$

$$9x = \cancel{-11} \cancel{+10}$$

$$x = \frac{10}{9}$$

$$y = \frac{x+3}{x-5}$$

x = ?

$$y(x-5) = x+3$$

$$yx - 5y = x + 3$$

$$yx - x - \underline{5y} = 3$$

$$yx - x = 3 + 5y$$

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

$$x = \frac{3+5y}{y-1}$$

$$25^{3x+2} = 5^{7x+1}$$

$$(5^2)^{3x+2} = 5^{7x+1}$$

$$\underline{5}^{6x+4} = \underline{5}^{7x+1}$$

$$6x+4 = 7x+1$$

$$3 = x$$

$$x^2 + 10x + 7$$

$$(x+5)^2 - (5)^2 + 7$$

$$(x+5)^2 - 25 + 7$$

$$(x+5)^2 - 18$$

turning point: $(-5, -18)$

Solve: $x^2 + 10x + 7 = 0$

$$(x+5)^2 - 18 = 0$$

$$(x+5)^2 = 18$$

$$x+5 = \pm\sqrt{18}$$

$$x = -5 \pm \sqrt{9} \sqrt{2}$$

$$x = -5 \pm 3\sqrt{2}$$



Using Difference of Two
Squares Factorise The Below
Questions.

$$4 - 3 = (2 + \sqrt{3})(2 - \sqrt{3})$$

$$5 - 3 = (\sqrt{5} + \sqrt{3})(\sqrt{5} - \sqrt{3})$$

$$9 - 7 = (3 + \sqrt{7})(3 - \sqrt{7})$$

Complete the square

$$x^2 - 9x + 1 = (x-a)^2 - b$$

$$= \left(x - \frac{9}{2}\right)^2 - \left(-\frac{9}{2}\right)^2 + 1$$

copy

$$= \left(x - \frac{9}{2}\right)^2 - \frac{81}{4} + \frac{4}{4}$$

$$= \left(x - \frac{9}{2}\right)^2 - \frac{77}{4}$$

\uparrow
 a

\uparrow
 b

$$a = -\frac{9}{2}$$

$$b = \frac{77}{4}$$

* Simplify *

$$x^8 \times x^6 = x^{14}$$

$$x^{20} \div x^8 = x^{12}$$

$$3x^2 \times 7x^3 = 21x^5$$

$$9x^8 \div 3x^5 = 3x^3$$

$$(x-1)(x+2) =$$

$$x^2 + 2x - x - 2 =$$

$$x^2 - x - 2$$

Expand

$$x(7x-1) = 7x^2 - x$$

$$4 \cdot 9^{\frac{1}{2}} = 7$$

$$\sqrt{3} \times \sqrt{3} = 3$$

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* @mathsuk *

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* like *

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* post ?? *

Factorise

$$2\underline{x^8y^{16}} + \underline{16x^4y^5}$$
$$= \underline{2x^4y^5} (\underline{x^4y^{11}} + \underline{8})$$

$$\frac{\frac{2}{x+3} + \frac{3}{x+4} - \frac{4}{x+5}}{(x+3)(x+4)(x+5)} \quad \left. \begin{array}{l} \text{single fraction} \\ \text{expanded denominator} \end{array} \right\}$$

$$\begin{aligned} 2(x+4)(x+5) &= 2(x^2 + 9x + 20) \\ &= 2x^2 + 18x + 40 \\ 3(x+3)(x+5) &= 3(x^2 + 8x + 15) \\ &= 3x^2 + 24x + 45 \\ -4(x+3)(x+4) &= -4(x^2 + 7x + 12) \\ &= -4x^2 - 28x - 48 \end{aligned}$$

$$\frac{2x^2 + 18x + 40 + 3x^2 + 24x + 45 - 4x^2 - 28x - 48}{(x+3)(x+4)(x+5)}$$

$$\frac{x^2 + 14x + 37}{(x+3)(x+4)(x+5)}$$

$$(x+3)(x+4) = x^2 + 7x + 12$$

$$\begin{array}{r|rrr|r} x & x^2 & 7x & 12 \\ \hline x & x^3 & 7x^2 & 12x \\ \hline 1 & 5x^2 & 35x & 60 \end{array} \Rightarrow x^3 + 12x^2 + 47x + 60$$

Solution: $\frac{x^2 + 14x + 37}{x^3 + 12x^2 + 47x + 60}$

follow @mathsuk

$$r = \frac{2x+5}{3x-2} \quad x = ?$$

$$r(3x-2) = 2x+5$$

$$3xr - 2r = 2x + 5$$

$$3xr - 2x - 2r = 5$$

$$3xr - 2x = 5 + 2r$$

$$x(3r - 2) = 5 + 2r$$

$$x = \frac{5+2r}{3r-2}$$

a = 1 a
b = 1 b
c = 1 c
d = 1 d
e = 1 e
f = 1 f
g = 1 g
h = 1 h
i = 1 i
j = 1 j
k = 1 k
l = 1 l
m = 1 m
n = 1 n
o = 1 o
p = 1 p

q = 1 q
r = 1 r
s = 1 s
t = 1 t
u = 1 u
v = 1 v
w = 1 w
x = 1 x
y = 1 y
z = 1 z

$$\sqrt{200} = \sqrt{100} \sqrt{2} = 10\sqrt{2}$$

$$\sqrt{18} = \sqrt{9} \sqrt{2} = 3\sqrt{2}$$

$$\sqrt{72} = \sqrt{36} \sqrt{2} = 6\sqrt{2}$$

$$13^2 = | \begin{matrix} 6 & 9 \\ \text{switch} \end{matrix} \quad \} \quad \text{cool trick to remember}$$
$$14^2 = | \begin{matrix} 9 & 6 \end{matrix} \quad \}$$

follow @mathsuk for more

Solve

Follow
@mathsuk

$$(x+3)^2 - 4 = 12$$

$$1^{\frac{1}{2}} = 1$$

$$4^{\frac{1}{2}} = 2$$

$$9^{\frac{1}{2}} = 3$$

$$1^{\frac{1}{3}} = 1$$

$$8^{\frac{1}{3}} = 2$$

$$27^{\frac{1}{3}} = 3$$

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

$$3^{-1} = \frac{1}{3}$$

$$4^{-1} = \frac{1}{4}$$

$$2^{-2} = \frac{1}{4}$$

$$3^{-2} =$$

$$4^{-2} =$$

$$2^{-3} = -\frac{1}{8}$$

$$3^{-3} = \frac{1}{27}$$

$$\sqrt[3]{9} = 9^{\frac{1}{3}}$$

$$\sqrt[3]{3} = 3^{\frac{1}{3}}$$

Grade 9

$$\cancel{X} \frac{1024}{\cancel{1}} = 16^{\cancel{x-11}}$$

$$= X 2^{10} = (2^4)^{\cancel{x-11}}$$

$$2^{\cancel{16}} = 2^{-44}$$

$$\therefore \underline{16} = \underline{-44}$$

$\nwarrow +44$

$$\therefore \underline{60} = \underline{-}$$

$\therefore 15 = x$

{ @gse mat
@algebra

$$3x^2 - 17x - 6 = 0$$

+ -

$\begin{array}{r} x \\ \hline +1 & -18 \\ \hline 2 & 9 \end{array}$

Hand

$$\begin{aligned}
 & 3x^2 + 1x - 18x - 6 = 0 \\
 & \underbrace{3x^2 + 1x}_{x(3x + 1)} - \underbrace{18x - 6}_{6(x - 3)} = 0 \\
 & \underbrace{x(3x + 1)}_{(3x + 1)} - \underbrace{6(x - 3)}_{(x - 3)}
 \end{aligned}$$

% trick

Follow
@mathsuk

$$\textcircled{1} \quad 80\% \text{ of } 110 =$$

$\downarrow \div 10$ \downarrow $\downarrow \div 10$
 8 \times 11 $= 88$

$$\textcircled{2} \quad 70\% \text{ of } 250 =$$

$\downarrow \div 10$ \downarrow $\downarrow \div 10$
 7 \times 25 $= 175$

$$\textcircled{3} \quad 90\% \text{ of } \underline{\overline{360}} = ?$$

\swarrow x \nearrow

$$6 \frac{4}{3} = \frac{1}{4}$$

slips cuberoot