Transpose the following

1. Make C the subject of the formula $F = 1.8C + 32$

$-32 \quad -32$

$\frac{F-32}{1.8} = \frac{1.8C}{1.8}$

$C = \frac{F-32}{1.8}$

2. Make x the subject of the formula $v = \frac{k}{\sqrt{x}}$

$\sqrt{x} \cdot v = k$

$\sqrt{x} = \left(\frac{k}{v}\right)^2 \quad x = \left(\frac{k}{v}\right)^2 \quad x = \frac{k^2}{v^2}$

3. Make b the subject of the formula $p = \sqrt{a+b}$

$(p)^2 = (\sqrt{a+b})^2$

$p^2 = a + b$

$-a \quad -a$

$b = p^2 - a$

4. Make s the subject of the formula $s = ut + \frac{1}{2}at^2$

$s = ut + \frac{1}{2}at^2$

5. Make x the subject of the formula $y = 4 - x^2$

$-4 \quad -4$

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

$\sqrt{x^2} = \sqrt{\frac{y-4}{-1}}$

$x = \sqrt{\frac{y-4}{-1}}$

$x = \sqrt{\frac{y}{-1} - \frac{4}{-1}}$

$x = \sqrt{-y+4}$

$x = \sqrt{4-y}$

6. Make t the subject of the equation $\frac{a}{b} = \frac{t-m}{t}$

$-t \quad -t$

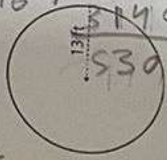
$t = \frac{mb}{cb-a}$

$A = \pi r^2$

$\pi(13)^2$

$3.14(13)^2$

$3.14(169)$

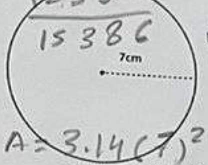


Area = 530.66 ft²

Circumference = $2\pi r$

$2(3.14)(13)$

= 81.64 ft



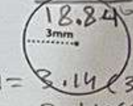
$A = 3.14(7)^2$

$3.14(49)$

Area = 153.86 cm²

Circumference = $2(3.14)(7)$

$2(21.98)$ = 43.96 cm

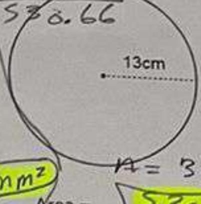


$A = 3.14(3)^2$

$3.14(9)$

Area = 28.26 mm²

Circumference = $2(3.14)(3)$ = 18.84 mm

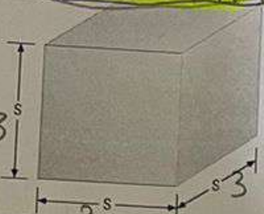


$A = 3.14(13)^2$

Area = 530.66 cm²

Circumference = $2(3.14)(13)$ = 81.64 cm

4. Calculate the volume of the following 3D shapes



Volume 1 = S . S . S

S = 3cm

V = S . S . S

= 3 × 3 × 3 or $3^3 = 27$

= 27 cm³

Volume 2 = S . S . S

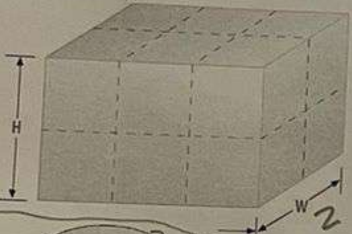
S = 12ft

V = S . S . S

12 . 12 . 12

= 144 . 12

= 1728 ft³



Volume 1 = L w h

H=2cm/L=3cm/W=2cm

V = L w h

= 3 . 2 . 2

= 12 cm³

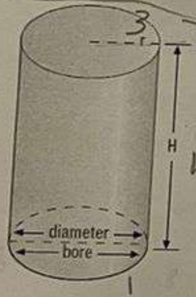
Volume 2 =

H=7Inch/L=8inch/W=6inch

V = L w h

= 8 . 6 . 7

= 336 inch³



Volume 1= $\pi r^2 h$

r=3mm/H=15mm

$V = 3.14(3)^2(15)$

$3.14(9)(15)$

= 423.90 mm³

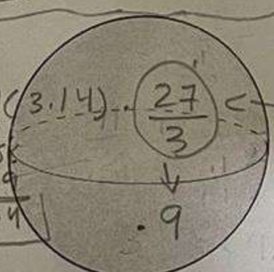
Volume 2= $\pi r^2 h$

r=11inch/H=21inch

$3.14(11)^2(21)$

$3.14(121)(21)$

= 7978.74 in³



Volume 1 = $\frac{4}{3}\pi r^3$

r=3mm

$\frac{4}{3}(3.14)(3)^3$

$\frac{4}{3}(3.14)(27)$

= 113.04 mm³

Volume 2 = $\frac{4}{3}\pi r^3$

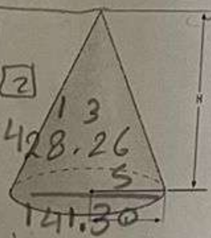
r=11inch

$\frac{4}{3}\pi r^3$

$\frac{4}{3}(3.14)(11)^3$

$4(3.14) . \frac{1331}{3}$

12.56 × 443.66 = 5572.16 inch³



Volume 1= $\frac{1}{3}\pi r^2 h$ or $\pi r^2 \frac{h}{3}$

r=3mm/H=15mm

$\frac{1}{3}(3.14)(3)^2(15)$

$\frac{1}{3}(3.14)(9)(15)$

$3.14(9) . \frac{15}{3}$

$3.14(9) . 5$

= 141.30 mm³

Volume 2= $\frac{1}{3}\pi r^2 h$ or $\pi r^2 \frac{h}{3}$

r=11inch/H=21inch

$\frac{1}{3}\pi(11)^2(21)$

$\frac{1}{3}(3.14)(121)(21)$

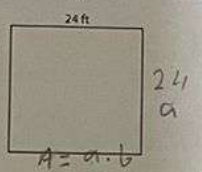
$3.14(121) . \frac{21}{3}$

$3.14(121) . 7$

= 2659.58 in³

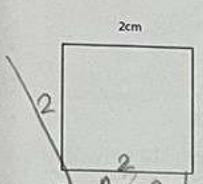
Area , Perimeter and Volume

1. Calculate the perimeter and area of the shapes below



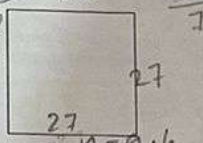
Area = 24 x 24 = 576 ft²

Perimeter = 24 + 24 + 24 + 24 or 24 x 4 = 96 ft



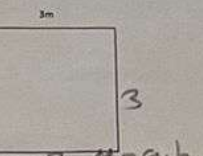
Area = 2 x 2 = 4 cm²

Perimeter = 2 + 2 + 2 + 2 = 8 cm



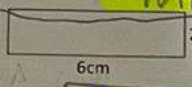
Area = 27 x 27 = 729 inch²

Perimeter = 27 + 27 + 27 + 27 or 27 x 4 = 108 inch



Area = 3 x 3 = 9 m²

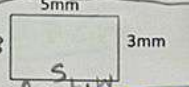
Perimeter = 3 + 3 + 3 + 3 = 12 m



A = L.W = 6.2 = 12

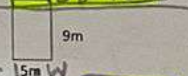
Area = 12 square cm

Perimeter = 2(6) + 2(2) = 12 + 4 = 16 cm



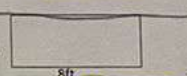
Area = 5 x 3 = 15 square mm

Perimeter = 2(3) + 2(5) = 6 + 10 = 16 mm



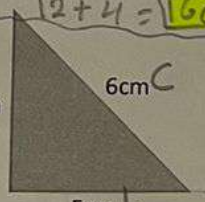
Area = 9 x 5 = 45 square m

Perimeter = 2(9) + 2(5) = 18 + 10 = 28 m



Area = 3 x 8 = 24 square ft

Perimeter = 2(3) + 2(8) = 6 + 16 = 22 ft

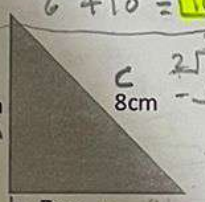


A = ab/2 = 5x5/2 = 25/2 = 12.5

Area = ½bh = ½ x 5 x 5

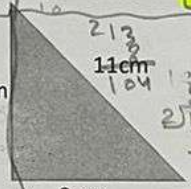
A = 12.5 cm²

Perimeter = a + b + c = 5 + 5 + 6 = 16 cm



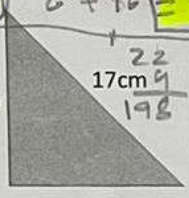
Area = 9 x 7/2 = 63/2 = 31.5

Perimeter = a + b + c = 9 + 7 + 8 = 24 cm



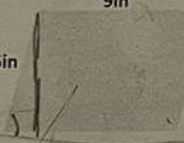
Area = 13 x 8 / 2 = 104/2 = 52 cm²

Perimeter = 13 + 8 + 11 = 32 cm



Area = 9 x 22 / 2 = 198/2 = 99 cm²

Perimeter = 9 + 22 + 17 = 418 cm

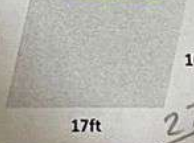


Area = _____

Perimeter = _____

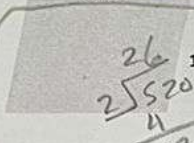
Area = _____

Perimeter = _____



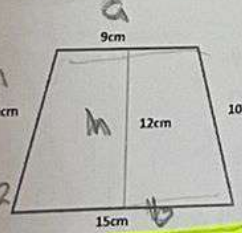
Area = _____

Perimeter = _____



Area = _____

Perimeter = _____



A = (a+b)h/2

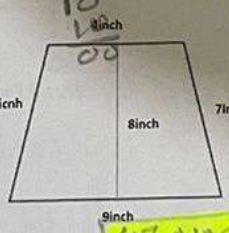
(9 + 15)12/2

(24/2)12

12(12) = 144

Area = 144 cm²

Perimeter = 9 + 15 + 10 + 10 = 9 + 15 + 20 = 24 + 20 = 44 cm



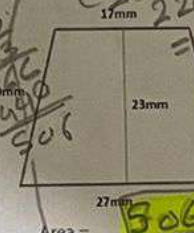
Area = 47.0 inch²

Perimeter = 4 + 9 + 7 + 7 = 13 + 14 = 27 inch

(4 + 9/2)8

(13/2)8

(6.5)8 = 47.0 inch²



Area = 506 mm²

Perimeter = 17 + 27 + 19 + 19 = 44 + 38 = 82 mm

Area = 7800 m²

Perimeter = 200 + 320 + 270 + 270 = 1060 m

1. 101_2 = 8_{10}
2. 1101_2 = 13_{10}
3. 110011_2 = 51_{10}
4. 101010_2 = 42_{10}

Convert the following octal numbers into their decimal equivalents.

1. 125_8 = 85_{10}
2. 74_8 = 60_{10}
3. 377_8 = 255_{10}
4. 1502_8 = 514_{10}

Convert the following hexadecimal numbers into their decimal equivalents.

1. $1B7_{16}$ = 439_{10}
2. $A5E_{16}$ = 734_{10}
3. $3F9_{16}$ = 761_{10}
4. $1D0B_{16}$ = 7435_{10}

1.7.1 Use trigonometric tables to find the values of the inverse sine, cosine and tangent (Arcsin, Arccos, Arctan) for angles between 0° and 90

Use the table in the book => page 3.14

1. Find the Sine, Cosine and Tangent of the following angle. (3 d.p.)

35° sin 35 = 0.574 cos 35= 0.819 tan 35= 0.700

2. Find the Sine, Cosine and Tangent of the following angle. (3 d.p.)

60° sin 60 = 0.866 cos 60= 0.500 tan 60 = $\frac{0.866}{0.500}$

3. Find the Sine, Cosine and Tangent of the following angle. (3 d.p.)

45° sin 45 = 0.707 cos 45= 0.707 tan 45= 1.000

4. Find the Sine, Cosine and Tangent of the following angle. (3 d.p.)

90° sin 90= 1 cos 90= 0 tan 90= undefined

5. Find the angle that has the following Sine (*Arcsin*).

0.940

$\sin\theta = 0.940 = \cos\theta = 0.94$

$\theta = 20$

$180 - 90 - 20$

$180 - 90 - \theta$

$\theta = 70^\circ$

use table page 3.14

$\sin\theta = \frac{opp}{hyp}$

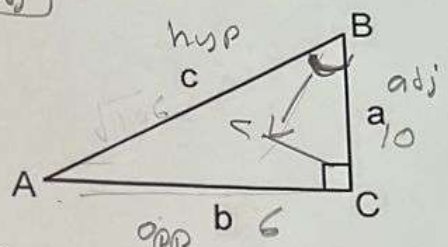
$\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$

Use the table page 3.14 important

a = 10 **b = 6**

B=



$\tan\theta = \frac{opp}{adj}$

$\tan\theta = \frac{6}{10}$

$\tan^{-1}\left(\frac{6}{10}\right) = \tan B = \frac{6}{10} = 0.6 \Rightarrow B = 31°$

16. Find angle ***A*** on the triangle shown. (2 d.p.)

b = 4 **c = 9**

A=

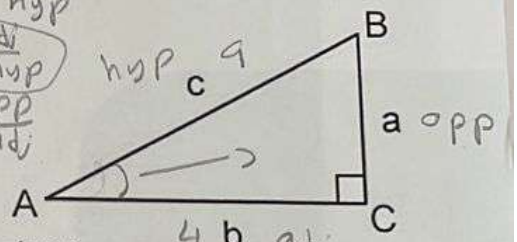
$\sin\theta = \frac{opp}{hyp}$

$\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$

$\cos\theta = \frac{adj}{hyp}$

$\cos\theta = \frac{4}{9}$



$\cos^{-1}\left(\frac{4}{9}\right) = \cos B = \frac{4}{9} = 0.444$

$\cos B = \sin B = 0.44 \Rightarrow B \approx 26.5°$

17. Find angle ***B*** on the triangle shown. (2 d.p.)

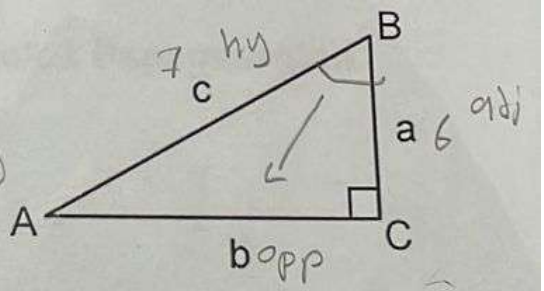
a = 6 **c = 7**

B=

$\sin\theta = \frac{opp}{hyp}$

$\cos\theta = \frac{adj}{hyp}$

$\tan\theta = \frac{opp}{adj}$



$\cos\theta = \frac{6}{7}$

$\cos^{-1}\left(\frac{6}{7}\right)$

$\cos B = \frac{6}{7} = 0.857 = \cos B = 0.857 \Rightarrow B = 31°$

Converting Binary to Decimal (A)

Write each binary number as a decimal number.

1. Binary = 1001
   Decimal = 9_{10}

2. Binary = 100000
   Decimal = 32_{10}

3. Binary = 1100101101
   Decimal = 813_{10}

4. Binary = 100001000
   Decimal = 264_{10}

5. Binary = 10101001
   Decimal = 169_{10}

6. Binary = 1010000100
   Decimal = 644_{10}

7. Binary = 1011010111
   Decimal = 727_{10}

8. Binary = 1010101111
   Decimal = 687_{10}

9. Binary = 1101111110100
   Decimal = 7156_{10}

10. Binary = 110110101111
    Decimal = 3503_{10}

AVIATION

MATHEMATICS

c. $2496 \div 62 =$ 40.258064 52

d. $74936 \div 34 =$ 2204 1

e. $232447 \div 95 =$ 2447

Calculate the following and correct to the number of decimal places (dp) where indicated:

a. $6.24 \div 2 =$ 3.12

b. $8.94 \div 0.9$ (2 dp) = 9.93

c. $0.747 \div 0.06 =$ 12.45

d. $24.276 \div 5.1 =$ 4.76

e. $0.7252 \div 0.37 =$ 1.96

f. $4793 \div 2.34$ (1 dp) = 20.482 ≈ 20.5

11. Which of the following are proper fractions?

r. 4 x 8 - 5 x 3 + 6 x 2=

s. 4 x (8 - 5) x (3 + 6) x 2=

t. 4 x 8 - (5 x (3 + 6 x 2))=

u. $\frac{8+7}{4+21}=$

v. $\frac{20}{6+9}$ =Type equation here.

w. $\frac{18-3}{35}=$

Identify the place value of the '1' in the following binary numbers.

1. 10_2 =
2. 1000_2 =
3. 10000_2 =
4. 1000000_2 =

Identify the place value of the '1' in the following octal numbers.

1. 451_8 =
2. 715_8 =
3. 135_8 =
4. 1275_8 =

Identify the place value of the '1' in the following hexadecimal numbers.

1. $A15_{16}$ =
2. $2F1_{16}$ =
3. $51BD_{16}$ =
4. $1C4E_{16}$ =

Convert the following binary numbers into their decimal equivalents.

Converting Decimal to Hexadecimal (A)

Write each decimal number as a hexadecimal number.

1. Decimal = 5
Hexadecimal = 5_{16}

2. Decimal = 50
Hexadecimal = 32_{16}

3. Decimal = 528
Hexadecimal = 210_{16}

4. Decimal = 860
Hexadecimal = $35C_{16}$

5. Decimal = 761
Hexadecimal = $2F9_{16}$

6. Decimal = 389
Hexadecimal = 185_{16}

7. Decimal = 605
Hexadecimal = $25D_{16}$

8. Decimal = 117
Hexadecimal = 75_{16}

9. Decimal = 4696
Hexadecimal = 1258_{16}

10. Decimal = 9400
Hexadecimal = $24B8_{16}$

Simultaneous Equations

$3x + 4y = 23$

$2x - 4y = 2$

$x - 2y = 1$

$x = 1 + 2y$

$3(1+2y) + 4y = 23$

$3 + 6y + 4y = 23$

$10y = 20$

$y = 2$

$x = 1 + 2y$

$= 1 + 2(2)$

$= 1 + 4$

$x = 5$

$3x + 2y = 4$

$4x + 5y = 17$

$x = \frac{4 - 2(5)}{3}$

$x = \frac{4 - 10}{3}$

$x = -2$

$4\left(\frac{4}{3} - \frac{2}{3}y\right) + 5y = 17$

$-\frac{8}{3}y + \frac{15}{3}y = \frac{35}{3}$

$\frac{7}{3}y = \frac{35}{3}$

$y = 5$

$3x + 5y = 19$

$2x - y = -9$

$x = \frac{-9 + y}{2}$

$y = 5$

$x = \frac{-9 + (5)}{2}$

$x = -2$

$3\left(\frac{-9}{2} + \frac{y}{2}\right) + 5y = 19$

$-\frac{27}{2} + \frac{3y}{2} + 5y = \frac{19}{1} \times \frac{2}{2}$

$\frac{3y}{2} + \frac{5y \times 2}{1 \times 2}$

$\frac{3y}{2} + \frac{10y}{2} = \frac{13y}{2}$

$26 \overline{)130}$ 130 000

5

$\frac{65}{2}$ $\frac{13}{21}$ 130 26

$\frac{130}{26} = \frac{26y}{26}$

$5x + 2y = 11$

$4x - 3y = 18$

$4x = 18 + 3y$

$x = \frac{18}{4} + \frac{3}{4}y$

$5\left(\frac{18}{4} + \frac{3}{4}y\right) + 2y = 11$

$\frac{90}{4} + \frac{15}{4}y + 2y = 11$

$\frac{23}{4}y = \frac{46}{4}$

$y = 2$

$x = \frac{-18 + 3y}{4}$

$x = \frac{18 + 3(-2)}{4}$

$x = \frac{18 - 6}{4} = \frac{12}{4}$

$x = 3$

$\frac{15}{4} + \frac{2y}{1} \times \frac{4}{4}$

$\frac{15}{4} + \frac{8y}{4} = \frac{23}{4}$

$\frac{13}{5} \times \frac{11}{4} - \frac{90}{4} - \frac{44}{46}$

$\frac{44}{4} - \frac{90}{4} = \frac{-46}{4}$

$3x + 4y = 200$

$2x + 3y = 144$

$\frac{2x}{2} = \frac{144 - 3y}{2}$

$x = \frac{144}{2} - \frac{3y}{2}$

$3\left(\frac{144}{2} - \frac{3y}{2}\right) + 4y = 200$

$-\frac{432}{2} - \frac{9y}{2} + 4y = 200$

$-\frac{9y}{2} + 4y = -\frac{32}{2}$

$-\frac{1}{2}y = -\frac{32}{2}$

$-64 = -2y$

$y = 32$

$x = \frac{144 - 3(32)}{2}$

$x = \frac{144 - 96}{2} = \frac{48}{2}$

$x = 24$

$\frac{144}{3} \times \frac{3}{432}$

$\frac{200}{2} \times \frac{2}{400}$

$\frac{432}{400} - \frac{400}{32}$

$\frac{2 \times 200 - 432}{2 \times 2}$

$\frac{400}{2} - \frac{432}{2}$

$-\frac{32}{2}$

$-\frac{9}{2}y + \frac{2 \times 4y}{2 \times 1}$

$-\frac{9}{2}y + \frac{8}{2}y = -\frac{1}{2}$

$-\frac{1}{2}y$

$\frac{32}{2} \overline{)64}$ 6 04 4 0

$\frac{32}{2}$ 64

$\frac{8}{3}y + \frac{5 \times 3y}{1 \times 3}$

$\frac{8}{3} + \frac{15}{3}$

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

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

$\frac{16}{3} - \frac{8}{3}y + \frac{5y \times 3}{1 \times 3} = 17$

$\frac{16}{3}$

$\frac{17}{1} \times \frac{3}{3} - \frac{16}{3} - \frac{5y + 11}{35}$

$\frac{51}{3} - \frac{16}{3} =$

$\frac{10}{21} = \frac{21y}{21}$

$y = 5$

$\frac{26}{3} \overline{)78}$ $\frac{3}{26} \overline{)130}$ 130 000

$\frac{21}{105} \overline{)5}$ 105 000

$\frac{21}{2} \overline{)42}$

$\frac{21 \times 4}{84}$

$\frac{21 \times 5}{105}$

$\frac{38}{2} + \frac{27}{2} = \frac{65}{2}$

$\frac{92}{184} \overline{)2}$ 184 000 92

$\frac{276}{92} \overline{)3}$ 276 92 184

$\frac{24}{2} \overline{)48}$ 48 00

Name: _____

Decimal to Binary

Sheet 1

Convert each decimal number to its binary equivalent.

1) $16_{10} = 10000_2$

2) $43_{10} = 101011_2$

3) $39_{10} = 100111_2$

4) $27_{10} = 11011_2$

5) $11_{10} = 1011_2$

6) $32_{10} = 100000_2$

7) $8_{10} = 1000_2$

8) $14_{10} = 1110_2$

9) $45_{10} = 101101_2$

10) $5_{10} = 101_2$

Important:

PEMDAS — Bracket, Exponent, multi, Divide, Add, Subtract

Order of operations

Solve the following.

1) $(20 + 12) \div 4 =$ 32 ÷ 4 = **8**

2) $50 + 6 \times (11 - 4) =$ 50 + 6 × (7) → 50 + 42 = **92**

3) $50 + 6 \times 11 - 4 =$ 50 + 66 − 4 → 116 − 4 = **112**

4) $9 \times (12 - 8) + 28 \div 7 =$ 9 × (4) + 28 ÷ 7 → 36 + 28 ÷ 7 → 36 + 4 = **40**

5) $18 - (21 - 5) \div (22 - 18) =$ 18 − (16) ÷ (4) → 18 − 16 ÷ 4 → 18 − 4 = **14**

6) $7 \times 2 - (9 + 2) + 14 =$ 7×2 − (11) + 14 → 14 − 11 + 14 → 3 + 14 = **17**

7) $(6 \div 3 + 5) \times (11 - 4) =$ (2 + 5) × (7) → 7 × 7 = **49**

8) $9 \times 3 + (20 - 18) \times 4 - 8 =$ 9×3 + (2) × 4 − 8 → 27 + 8 − 8 → 35 − 8 = **27**

9) $(37 - 17) \times (240 \div 20) - 22 \times 4 =$ 20 × 12 − 22 × 4 → 240 − 88 = **152**

10) $11 \times 4 - (6 + 3 + 13) \div 2 =$ **33**

44 − 22 ÷ 2 → 44 − 11 = **33**

Converting Decimal to Octal (A)

Write each decimal number as an octal number.

1. Decimal = 6
Octal = 6_8

2. Decimal = 97
Octal = 141_8

3. Decimal = 252
Octal = 374_8

4. Decimal = 196
Octal = 304_8

5. Decimal = 386
Octal = 602_8

6. Decimal = 179
Octal = 263_8

7. Decimal = 130
Octal = 202_8

8. Decimal = 895
Octal = 1577_8

9. Decimal = 7757
Octal = 17115_8

10. Decimal = 1656
Octal = 31708

Converting Hexadecimal to Decimal (A)

Write each hexadecimal number as a decimal number.

1. Hexadecimal = 2
   Decimal = 2_{10}

2. Hexadecimal = 54
   Decimal = 84_{10}

3. Hexadecimal = 18E
   Decimal = 398_{10}

4. Hexadecimal = 1E0
   Decimal = 480_{10}

5. Hexadecimal = 2B3
   Decimal = 691_{10}

6. Hexadecimal = E8
   Decimal = 232_{10}

7. Hexadecimal = 1C6
   Decimal = 454_{10}

8. Hexadecimal = 1E5
   Decimal = 485_{10}

9. Hexadecimal = 1F7D
   Decimal = 8061_{10}

10. Hexadecimal = 106C
    Decimal = 4204_{10}

Exercises:

1. Use the logarithm laws to simplify the following:
   (a) $\log_2 xy - \log_2 x^2$
   (b) $\log_2 \frac{8x^2}{y} + \log_2 2xy$
   (c) $\log_3 9xy^2 - \log_3 27xy$
   (d) $\log_4 (xy)^3 - \log_4 xy$
   (e) $\log_3 9x^4 - \log_3 (3x)^2$
2. Find x if:
   (a) $2\log_b 4 + \log_b 5 - \log_b 10 = \log_b x$
   (b) $\log_b 30 - \log_b 5^2 = \log_b x$
   (c) $\log_b 8 + \log_b x^2 = \log_b x$
   (d) $\log_b (x+2) - \log_b 4 = \log_b 3x$
   (e) $\log_b (x-1) + \log_b 3 = \log_b x$

a) $\log_b 4^2 + \log_b 5 - \log_b 10 = \log_b x$

$\log_b 4^2 + \log_b \frac{5}{10} = \log_b x$

$\log_b (16 \times \frac{5}{10})$

$\log_b \frac{80}{10}$

$\log_b 8 = \log_b x$

$x = 8$

b) $\log_b \frac{30 \div 5}{25 \div 5} = \log_b x$

$\frac{6}{5} = x$

c) $\log_b 8 = \log_b x - \log_b x^2$

$\log_b 8 = \log_b \frac{x}{x^2}$

$\log_b 8 = \log_b \frac{1}{x}$

$x \cdot 8 = \frac{1}{x} \cdot x$

$8x = 1$

$x = \frac{1}{8}$

d) $\log_b \frac{x+2}{4} = \log_b 3x$

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

$x + 2 = 12x$

$x - 12x = -2$

$-11x = -2$

$x = \frac{2}{11}$

e) $\log_b 3 = \log_b x - \log_b (x-1)$

$\log_b 3 = \log_b \frac{x}{x-1}$

$(x-1) \cdot 3 = \frac{x}{x-1} \cdot x - 1$

$3(x-1) = x$

$3x - 3 = x - 3x$

$-3x - 3 = -2x$

$-2 \quad -2$

$x = \frac{3}{2} \approx 1.5$

c. 0 .8316 x 4.3 = 3.57588

0.8316 × 4.3 → 24948 + 332640 = 35758 8

d. 37.96 x 4.5 = 170.820

37.96 × 4.5 → 18980 + 151840 = 170820

e. 124.03 x 12 = 1488.36

124.03 × 12 → 24806 + 124030 = 148836 → two decimal digits after point

f. 0.00312 x 3.26 = 0.0101712

0.00312 × 3.26 → 001872 + 006240 + 993600 = 0101712

g. 568.2 x 5.94 = 3375.108

568.2 × 5.94 → 22728 + 511380 + 2841000 = 3375108

h. 2 691.8 x 1.4 = 3768.52

2691.8 × 1.4 → 107672 + 26918 = 376852

i. 43.01 x 0.63 = 27.0963

43.01 × 0.63 → 12903 + 258060 + 000000 = 270963 → 4 decimal

Divide the following, giving quotient with the remainder as a whole number

a. 742 ÷ 5 = 148.4

5 | 742.0 → 5, 24, 20, 42, 40, 20, 20, 00

b. 1385 ÷ 4 = 346.25

4 | 1385.00 → 12, 18, 16, 25, 24, 10, 8, 20, 20, 00

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Expanding Brackets

Question 1: Expand the following brackets

(a) $5(y+3)$ → $5y+15$

(b) $4(a+2)$ → $4a+8$

(c) $8(w+10)$ → $8w+80$

(d) $3(x-7)$ → $3x-21$

(e) $p(2p+5)$ → $2p^2+5p$

(f) $2w(3w-1)$ → $6w^2-2w$

(g) $9y(2y+3)$ → $18y^2+27y$

(h) $4c(2a+5c)$ → $8ca+20c^2$

(g) $8(5+2m)+3(5-3m)$

$40+16m+15-9m$

$16m-9m+40+15$

$7m+55$

(h) $4(w+7)-2(2w+1)$

$4w+28-4w-2$

$4w-4w+28-2$

$=26$

(i) $9(1+2y)+3(3-y)$

$9+18y+9-3y$

$18y-3y+9+9$

$15y+18$

Linear equations

Question 2 Solve the following equations

(a) $2x+3=9$

$-3 \quad -3$

$\frac{2}{2}x=\frac{6}{2}$

$x=3$

(b) $3w-1=14$

$+1 \quad +1$

$\frac{3}{3}w=\frac{15}{3}$

$w=5$

(c) $7y+2=30$

$-2 \quad -2$

$\frac{7}{7}y=\frac{28}{7}$

$y=4$

(d) $\frac{2x}{3}=6 \cdot 3$

$\frac{2}{2}x=\frac{18}{2}$

$x=9$

(g) $\frac{2x}{7}+2=12$ -2 -2

$\frac{2x}{7}=10 \cdot 7$

$\frac{2x}{2}=\frac{70}{2}$

$x=35$

(h) $\frac{8x}{3}-9=7$

$+9 \quad +9$

$\frac{8x}{3}=16 \cdot 3$

$\frac{8}{8}x=\frac{48}{8}$

$x=6$

(i) $\frac{3x}{10}-4=8$

$+4 \quad +4$

$\frac{3x}{10}=12 \cdot 10$

$\frac{3x}{3}=\frac{120}{3}$

$x=40$

Converting Octal to Decimal (A)

Write each octal number as a decimal number.

1. Octal = 4_8
   Decimal = 4_{10}

2. Octal = 56
   Decimal = 46_{10}

3. Octal = 775
   Decimal = 509_{10}

4. Octal = 1606
   Decimal = 902_{10}

5. Octal = 443
   Decimal = 291_{10}

6. Octal = 1743
   Decimal = 995_{10}

7. Octal = 1113
   Decimal = 587_{10}

8. Octal = 1401
   Decimal = 769_{10}

9. Octal = 3746
   Decimal = 2022_{10}

10. Octal = 21770
    Decimal = 9208_{10}

$$\log_a a^x = x \log_a a = x \cdot 1 = x.$$

$$\boxed{\log_a a = y}$$

$$a^1 = a \Rightarrow \boxed{y = 1}$$

$$\log_a a = 1$$

$$\log_a x = y \iff a^y = x$$

$$\log_e x = y \iff e^y = x$$

$$\log_a a^y = y$$

$$a^y = a$$

$$\boxed{y = 1}$$

k. $2\frac{1}{4} \div 3\frac{3}{5} =$

l. $1\frac{1}{4} \times 1\frac{7}{9} \div 5\frac{5}{6} =$

$\frac{1}{12} \times \frac{1}{2} = \frac{10}{36}$ m.

$\frac{5}{8} \div \frac{10}{18} \times \frac{1}{2} =$ Type equation here.

$\frac{5}{8} \div \frac{10}{36} = \frac{5}{8} \times \frac{36}{10} = \frac{180}{80}$

Q Convert the following decimals to fractions or mixed numbers in their simplest form:

a. $\frac{0.79}{1} = \frac{\times 100}{\times 100} = \frac{7900}{100} = 79$

b. $\frac{0.925}{1} = \frac{\times 1000}{1000} = \frac{925}{1000} = 925$

c. $\frac{2.875}{1} =$ Type equation here. $= 2875$

d. $\frac{0.4}{1} = \frac{\times 10}{\times 10} = \frac{4 \div 2}{10 \div 2} = \frac{2}{5}$

e. $\frac{0.75}{1} = \frac{\times 100}{\times 100} = \frac{75}{100} = 75$

f. $\frac{2.9}{1} =$ Type equation here. $\frac{29}{10}$

g. $\frac{3.375}{1} =$ Type equation here. $\frac{3375}{1000}$

h. $\frac{1.1875}{1} =$ Type equation here. $\frac{11875}{10000} = 1875$

i. $\frac{4.5}{1} =$ Type equation here. $\frac{45}{10} = \frac{9}{2}$

Solve the following operations involving directed numbers:

a. $3 - 5 = -2$

b. $-8 + 5 = -3$