KEY

Essential Math Grade 10 Exam Review

Money

1) Calculate the unit cost for 100g to see which one costs more.

a) Cheese at $9.30/lb

1 lb = 0.45 kg

0.45 kg = 450 g

$\frac{\$9.30}{450g} = \frac{x}{100g}$ $x = \$2.07$

b) sausage at $5.61 for 275 g

$\frac{\$5.61}{275g} = \frac{x}{100g}$ $x = \$2.04$

The cheese costs more

2) Sara buys eggs at IGA $6.30 for an 18 carton, and Don buys eggs at Co-op $3.84 for dozen. What is the better deal?

SARA $\frac{\$6.30}{18 eggs} = \frac{\$0.35}{1 egg}$

DON $\frac{\$3.84}{12 egg} = \frac{\$0.32}{1 egg}$ *Better Deal!

Don buys the better deal at $3.84 per dozen.

3) Kole sells 1 kg of frozen turkey breasts for $15.90 and 300 g of fresh turkey for $5.50. Which has the lower unit price per 100g?

1 kg = 1000 g

FROZEN $\frac{\$15.90}{1000g} = \frac{\$1.59}{100g}$ ↑ lower Price

FRESH $\frac{\$5.50}{300g} = \frac{\$1.83}{100g}$

Frozen turkey has the lower unit price per 100g

4) Calculate each promotion

a) 20% off $880

$0.20 \times \$880 = \$176$ off

880 − 176 = $704

b) 5.5% off $1939

$0.055 \times \$1939 = 106.65$ off.

1939 − 106.65 = $1832.35

c) 2/3 off $255

$\frac{2}{3} \times \$255 = \$170$ off

255 − 170 = $85

d) 40% off $12.50

$0.4 \times \$12.50 = \$5$ off

12.50 − 5 = $7.50

5) Peter is a locksmith. After he ran ads in the newspaper, his sales increased by 1.9% from the previous year. His sales were $129189 the previous year. What were his new sales?

$0.019 \times \$129189 = \$2454.59$ increase

129189 + 2454.59 = $131643.59

The new sales were $131643.59

6) Sara need to sell her old inventory to make room for the new inventory.
On sandals she has a 70% off savings. What will a $35.99 pair now cost?
She puts winter boots out $69.99, which she marked up 33%. What did the boots cost her?

SANDALS
0.70 x 35.99
= $25.19 off

new cost: 35.99
−25.19
$10.80

BOOTS cost = x.
Cost + mark up = price.
x + (0.33 x x) = 69.99
x(1 + 0.33) = 69.99
x = 69.99 / 1.33
x = $52.62
Boots cost $52.62

7) Jane paid $23.99 for a pair of pants on sale. Last week she saw the original price was $39.99. What was the sale? $ off or % off

$ off
39.99
−23.99
$16.00
$16.00 off

% off
what % of $39.99 is $23.99?
23.99 / 39.99 = 59.99 / 100
60% off

8) Where should Alex buy his pencils if he needs 40
Walmart: 5 pack for $2 and 15% off

* needs 8 packs.
8 x $2 = $16
$16 x 0.15 = $2.40.
$16 − 2.40 = $13.60

Walgreen: 10 pack for $6, buy one get one free
Needs 4 packs. ↳ means 2 packs for $6.
4 pack = 2 x $6 = $12.00
Walgreens has the better deal!

9) Where should Jordan buy his new tv:
Costco: $2500 with a $250 rebate

$2500
− 250
$2250

Sears: $2350 with 10% discount
$2350 x 0.1 = $235 off.
2350
− 235
$2115

Sears has the better deal!

10) Where should Kevin rent for one year 12 mths
Place #1: $900 rent, plus half of rent for damage deposit before he rents, but gets 10% off first three months
Place #2: $915 a month, but first month is 30% off

PLACE 1
10% off = 0.1 x 900
$90 off a month for 3 months.
* Remaining 9 months @ 900

DAMAGE - 450
MONTH 1 - 810
2 - 810
3 - 810
$2880 + (9 x 900) = $10980

PLACE 2
0.3 x $915 = $274.50 off.
Month 1 → 915
−247.5
$640.50 + (11 x $915) = $10705.5
REMAINDING 11 months @ $915

PLACE 2 is less money up front.

Income

1) Name a job that gets paid in each way: *various. These are just examples

a) hourly wage cashier

b) contract carpenter

c) commission car salesman

d) salary teacher

2) Sara manages a clothing boutique and has an annual salary of $37800. April works in a shoe store and is paid $15.25/h for 35 hours each week. Who has the higher gross income each month?

$37800 / 12 mth = $3150 / 1 mth

SARA

APRIL $15.25 x 35 hr = $533.75/wk.

x 4 wks = $2135/mth

SARA has the higher gross income!

3) Monica is a freelance editor with a contract that pays $17000 over three months. Mika works 40 hrs each week for a newspaper and earns $30/hr. Who has the higher gross income over this three month period? By how much?

MONICA = $17000.

MIKA → $30 x 40 hr = $1200/week x 4 weeks = 4800/mth x 3 = $14400

17000
−14400
$2600

MONICA makes more by $2600.

4) Jacki works for a deck and fence company. She is paid hourly wage of $12.33. She usually works 8 hr days, 5 days a week. When she works more than 40, she gets double. What is Jacki's gross income for 50 hrs in a week?

40hr reg. → $12.33 x 40 = $493.20

10hr OT → x2 24.66 x 10 = $246.60

$739.80

Jacki gets $739.80 for the 50 hr work week.

5) John earns an annual salary of $32,600.
This year he will receive a 4.5% bonus.

Who earned more this year? By how much?

John

0.045 x 32600 = $1467 (Bonus)

Total = $32600 + $1467

= $34067

Marie earns $17.70/hr.
She averages per week: 25 hours and also gets $240 in tips.

MARIE

1 week = $17.70 x 25 hr = $442.50

+240 in tips

= $682.50

$682.50 / 1 week = $35490. / 52 weeks

*Marie makes more ~~this~~ year by $1423.

* Exchange rates will be on exam!

$1 CAN = $0.77 USD
= $0.66 Euro
= $15.75 Peso
= $85.25 Yen

11) Greg wants half his money to exchange to Euros and the other half to Yens. His brings CAN $1000 to the bank to exchange. How much of each currency will he get?

$\frac{\$1 \text{ CAN}}{\$0.66 \text{ Euro}} = \frac{\$500 \text{ CAN}}{\$330 \text{ Euro}}$

$\frac{\$1 \text{ CAN}}{85.25 \text{ yen}} = \frac{\$500 \text{ CAN}}{\$4262.00}$

Greg will get $330 Euros and $85.25 yen

12) Sara (Canadian) took $2000 to the bank to get Pesos. While on holiday in Mexico, she spent 2000 Pesos. She went to the bank to exchange the remainder back to Canadian dollars. How much Canadian money did she get?

$\frac{1 \text{ CAN}}{15.75 \text{ peso}} = \frac{2000 \text{ CAN}}{31500 \text{ peso}}$

31500 peso − 2000 peso = 29500 peso left

$\frac{1 \text{ CAN}}{15.75 \text{ peso}} = \frac{\$1873.02}{29500 \text{ peso}}$

Sara got $1873.02 CAN back

13) You are Canadian and have a Canadian credit card. An article of clothing costs $75.99 in USA. How much appeared on your credit card after you bought it?

$\frac{\$1 \text{ CAN}}{\$0.77 \text{ USD}} = \frac{\$98.69 \text{ CAN}}{\$75.99 \text{ USD}}$

$98.69 CAN appeared on your credit card.

14) You take CAN $5000 to the bank and exchange to get how much US $?

$\frac{\$1 \text{ CAN}}{\$0.77 \text{ USD}} = \frac{\$5000 \text{ CAN}}{\$3850 \text{ USD}}$

15) You bought $5000 US dollars. How much did they take out of Your Canadian account?

$\frac{\$1 \text{ CAN}}{\$0.77 \text{ USD}} = \frac{\$6493.50 \text{ CAN}}{\$5000 \text{ USD}}$

6) Paul earns $15.10/h and Yvonne earns $12.50/h plus time and a half for hours over 40 per week. Compare their incomes for 49 hours a week.

PAUL

$\frac{\$15.10}{1\text{ hr}} = \frac{\$739.90}{49\text{ hr}}$

YVONNE

$\frac{\$12.50}{1\text{ hr}} = \frac{\$500}{40\text{ hr}}$

9 hrs at * time & half

$= 1.5 \times 12.50$

$= \frac{\$18.75}{1\text{ hr}} = \frac{\$168.75}{9\text{ h}}$

Total = $500 + $168.75 = $668.75

PAUL is paid more.

7) Sonya is a waiter and Jon sells magazines. Who has a higher gross annual income if they both work 48 weeks in the year?

Sonya: $11.30/hr, 40 hrs/week plus $300/ week in tips / Jon: $500/week plus 4.2% commission on $6000/week in sales

SONYA

wages

$\frac{\$11.30}{1\text{ hr}} = \frac{\$452}{40\text{ hr}}$ + $300 in tips

$= \$752/\text{week}$

$\frac{\$752}{1\text{ week}} = \frac{\$36,096}{48\text{ weeks}}$

JON

commission

$0.042 \times \$6000 = \$252$ in commission a week.

$500 + $252 = $752 a week

$\frac{\$752}{1\text{ week}} = \frac{\$36,096}{48\text{ weeks}}$

* THEIR ANNUAL INCOMES ARE EQUAL!

8) Jody installs telephones. She earns $18.29/hr plus time and a half for any hours over 40/week. Last week she worked 52 hours.

Aidan earns an annual salary of $59000 as the director of sales at a computer company (52 weeks in 1 yr.)

Who had the higher gross income last week?

JODY

$18.29 × 40 hrs = $731.60 (Reg. pay)

× 1.5

$27.44 × (52 − 40) = + $329.28 (OT pay)

$1060.88

AIDAN

$\frac{\$59000}{52\text{ weeks}} = \frac{\$1134.62}{1\text{ week}}$

Aidan has the higher gross income.

9) For 40 hours a week, 46 weeks a year, what hourly wage is equivalent to an annual salary of $95,000?

* How much per week? $\frac{\$95000}{46\text{ weeks}} = \frac{\$2065.22}{1\text{ week}}$

* How much per hr? (40h = 1 week) $\frac{\$2065.22}{40\text{ hr}} = \frac{\$51.63}{1\text{ hr}}$

Annual salary of $95,000 is the same as $51.63/hr for a 40 hr week for 46 weeks a year.

10) Mindy is an electrician and Bridget assembles computers. Mindy earns $16.50/hr and a shift premium of $1.25/hr for hours after 6pm. Last week she worked 48 hours, including 15 hours on night shift (after 8pm). Bridget earns $7.80 for each computer. How many computers must Bridget assemble in a week to match Mindy's gross income for the week? (round)

MINDY

48 - 15 = 33 reg hours

Reg → 33 hr x $16.50 = $544.50

N. shift → 15 hr x $17.75 = $266.25

$810.75

BRIDGET

computers x $7.80 = $810.75

computers = $810.75 / $7.80

= 103.9 → 104 computers

*Bridget must assemble 104 computers

11) Suppose you would like to earn at least $400 a week and you have two part time job offers. Job A pays $11.95/hr, 30 hrs a week. Job B pays $14.70/hr, 20 hours a week plus 2.5% commission of sales of $5000/week. Which job should you take?

JOB A

$11.95 x 30 = $358.50

JOB B

$14.70 x 20 = $294

0.025 x $5000 = 125

$419

Take Job B!

12) The company that Lars works for installing car stereos has changed ownership. He used to earn $17.88/hr for a 40 hr week. Now he is paid $40 for each stereo he installs and he averages 18 installations a week. Does this change benefit Lars? Explain.

OLD

$17.88 x 40 = $715.20

It seems to benefit him. However, if he doesn't install 18 stereos in a week he loses out on money

NEW

$40 x 18 = $720.00

13) Liza is a bank teller earning an annual salary of $48000. Sasha works as a legal secretary and is paid $19.10/hr and double time for hours over 35/week. How many hours of overtime must Sasha work each week to earn as much as Liza?

LIZA → weekly salary = $48000 ÷ 52 weeks = $923.08

Sasha!

Reg pay → 35 x 19.10 = $668.50

OT pay = 923.08 - 668.50 = $254.58

hours x 38.2 = 254.58

hr = 254.58 ÷ 38.2 = 6.66

Sasha must work 6.7 hours (round to 7) to earn as much as Liza.

14) Alice manages a big-box store and earns $52800 a year. This year her company met all sales targets and she will receive a bonus that is 3.25% of her salary. Jeff installs heating and cooling equipment for $18.15/hr and double time for hours worked over 40 hrs a week. He averages 50 hours each week. Who has the higher gross annual income?

ALICE

Ann. Income = salary + bonus
= $52800 + 1716
= $54516

Bonus = 0.0325 × 52800
= $1716

JEFF

40 hr × 18.15 = $726
10 hr × 36.30 = $363
$1089/week
× 52 weeks = $56628

Jeff has the higher annual income.

15) Rhonda sells peanuts at football games. She earns $20 per game plus 30¢ for each bag she sells. She averages about 150 bags sold per game. How much will she earn over 8 games?

1 game → $20 + (0.30 × 150)
= $20 + $45
= $65 × 8 games = $520

Rhonda will earn $520 for 8 games

16) Marissa works 40 hrs a week earning $11.35/hr. Her deductions are EI: 1.73%, CPP: 3%, income tax: 12%, union dues: $6.10. What is her net weekly income?

Gross (Before Deductions)
= 40 hr × $11.35
= $454

Before Tax Deductions
Union dues → $6.10
$454
− 6.10
$447.90 (taxable income)

Taxed
EI: 0.0173 × $447.90 = $7.75
CPP: 0.03 × $447.90 = $13.44
TAX: 0.12 × $447.90 = $53.75
total ded = $74.94
447.90 − 74.94 = $372.96
Net Income

Measurement

1) Roger is 68 inches tall. Covert his height to feet and inches.

$\frac{68 \text{ in}}{5.6 \text{ ft}} = \frac{12 \text{ in}}{1 \text{ ft}}$ ✓

× means 5 whole feet.

5 × 12 = 60 inches
68 − 60 = 8 inches left

5 feet 8 inches

2) A toddler is 2ft 11 in. To go on the bumper cars at Tinker Town, he must be 32 inches or more. Convert his height to inches to see if he can go on the ride.

2ft 11in
× 12
24 inch + 11in = 35in.

The toddler can go on the ride

3) Convert the following measurements:

a) 4yd 1 ft 10 in (to in)=

$\times 36$ (144in) + $\times 12$ (12in) + 10 = **166 in**

b) 353 inches (to yd, ft, in)=

9 yd 2 ft 5 in

353in = 9.8 yd = 36in / 1yd.

9 × 36 = 324 in.

353 − 324 = 29 in left

29in = 2.4 ft = 12in / 1ft

2 × 12 = 24 in

29 − 24 = 5 in.

c) 22 ft (to yd, ft) =

22ft = 7.3 yd = 3ft / 1yd

7 yd, 1 ft

7 × 3 = 21 ft 22 − 21 = 1 ft left

d) 7 miles (to yards) =

7 mile = 12320 yd = 1mile / 1760yd.

4) Reid ran a 5 mile race. Each stride he takes is 2 ½ ft long. How many strides will it take him to finish the race?

1 stride = 2.5 ft.

5 mile = 26400 ft = 1mile / 5280ft.

total feet in 5 mile ÷ feet of stride = strides.

26400 ÷ 2.5 = **10560 strides**

5) You are building a staircase. Each step measures 6 ¼ in. You build a deck that has a height off the ground of 7 ft 3.5 in. How many steps are there?

7ft 3.5in = _____ inches.

$\times 12$

84in + 3.5in = 87.5 inches ← total height.

height ÷ height of stairs = #stairs.

87.5in ÷ 6.25 = **14 stairs**

6) Convert the following measurements:

a) 580 m (to cm)=

580m = 58000cm = 1m / 100cm

b) 0.44 hm (to cm)=

Do Not Need to know

c) 109 km (to m)=

109 km = 109000 m = 1km / 1000m

d) 208 dam (to km)=

Do Not Need to know

e) 0.9 m (to km)=

0.9m = 0.0009 km = 1000m / 1km

f) 9746 mm (to cm)=

9746mm = 974.6 cm = 10mm / 1cm

7) A tree is 19.7 m to the top. How high will your ladder be in cm to reach the top?

19.7m = 1970 cm = 1m / 100cm

8) Tiles are 3 decimeters (10) wide. How many tiles would you need to cover a room that is 2 meters wide? Is there left over tile (how much)?

3 x 10cm = 30cm each

2m x 100cm = 200cm wide

Room width ÷ tile width = # tile

200cm ÷ 30cm = 6.7 tiles → Round to 7 tiles with 0.3 of a tile left (10cm left)

9) Hailey ran a 6 km race. Each stride she takes is 0.8 meters. How many strides will it take her to complete the race?

6 km = 6000 m

Race length ÷ stride length = # strides.

6000m ÷ 0.8m = 7500. strides

10) Estimate the length

a) height to ceiling: ~10 - 12 ft.

b) height of a juice box: ~ 10cm

c) length of a car: ~4m.

11) What (type of unit) would you use to measure these objects:

a) width of a tooth: mm

b) distance to Regina: km/mile

c) height of the school: m/yd.

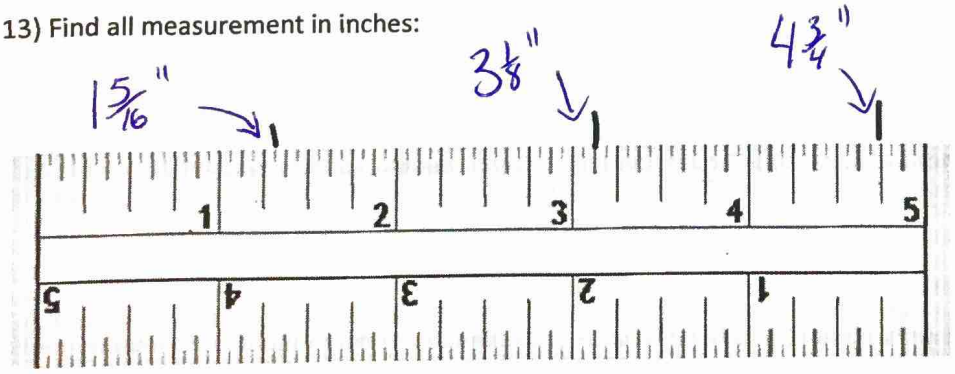
12) Measure these lines:

a) _____ (inches) 4 3/8 in.

b) _____ (cm) 15.3cm

c) _____ (mm) 48 mm

13) Find all measurement in inches:



1 in = 2.54 cm **1 ft = 0.31m** **1yd = 0.91 m** **1mi= 1.61km**

14) Covert the following:

a) 98 in (to cm)=

$98\text{in} = \frac{1\text{in}}{2.54\text{cm}}$ → 248.92 cm

b) 11 yd 2 ft (to m)=

$\times 3$: $33\text{ft} + 2 = 35\text{ft}$

$35\text{ft} = \frac{1\text{ft}}{0.31\text{m}}$ → 10.85 m

c) 7 mi (to m)=

$7\text{mi} = \frac{1\text{mi}}{1.61\text{km}}$ → 11.27 km

$\times 1000 =$ 11270 m

d) 22 miles (to km)=

$22\text{mi} = \frac{1\text{mi}}{1.61\text{km}}$ → 35.42 km

e) 2 yd (to cm)=

$2\text{yd} = \frac{1\text{yd}}{0.91\text{m}}$ → 1.82 m

$\times 100 =$ 182 cm

f) 47 in (to m)=

$47\text{in} = \frac{1\text{in}}{2.54\text{cm}}$ → 119.38 cm

$\div 100 =$ 1.19 m

15) If you are 5'2", how tall are you in cm?

$5\text{ft} \times 12 = 60\text{in} + 2\text{in} = 62\text{in} = \frac{1\text{in}}{2.54}$ → 157.48 cm

16) Derek's pickup is 19.75 ft. Will it fit into a garage that is 6 m long?

$19.75\text{ft} = \frac{1\text{ft}}{0.31\text{m}}$ → 6.12 m

No, it it too long

1cm = 0.39in **1 m = 1.09 yd** **1km = 0.62 mi**

17) Covert the following:

a) 99 mm (to in)=

99mm = 9.9cm

$9.9\text{cm} = \frac{1\text{cm}}{0.39\text{in}}$ → 3.86 in

b) 8.2 m (to in)=

$820\text{cm} = \frac{1\text{cm}}{0.39\text{in}}$ → 319.8 in

c) 19 m (to yards)=

$19\text{m} = \frac{1\text{m}}{1.09\text{yd}}$ → 20.71 yd

d) 73 km (to mi)=

$73\text{km} = \frac{1\text{km}}{0.62\text{mi}}$ → 45.26 mi

e) 405 cm (to yards) =

$405\text{m} = \frac{1\text{m}}{1.09\text{yd}}$ → 4.41 yd

f) 5766 mm (to yards) =

$5.766\text{m} = \frac{1\text{m}}{1.09\text{yd}}$ → 6.28 yd

18) Joelle ran a 5 km race. How many strides will she take in the race if each stride is 0.9 yard long?

$5\text{km} = \frac{1\text{km}}{1.09\text{yd}}$ → 5.45 yd

$5.45 \div 0.9 =$ 6.06 strides.

19) The thickness of a quarter is .955 in. How thick is a $10 roll in cm?

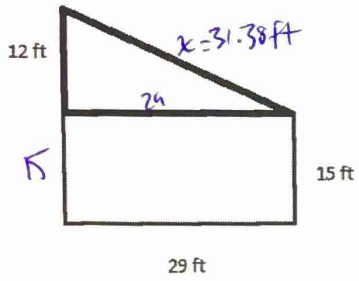
$10 ÷ .25 = 40 quarters in the roll.

40 × 0.955 = 38.2 in.

$\frac{38.2\text{ in}}{97.9\text{ cm}} = \frac{0.39\text{ in}}{1\text{ cm}}$

Measurement

1) The basement room measures the following. Find the perimeter. (note you will have to use Pythagorean theorem)



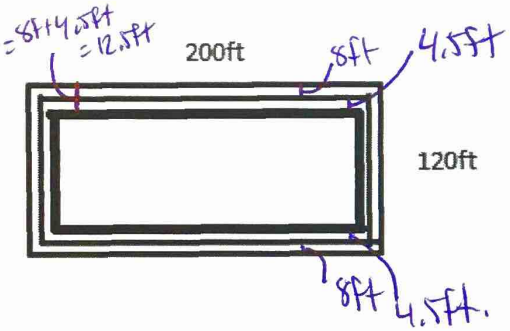
$x = \sqrt{29^2 + 12^2}$

$= 31.038$ ft

12
+ 15
+ 29
+ 15
+ 31.38

102.38 ft

2) A person puts a row of evergreens on the outside of their yard (takes up 8 ft across) followed by an inside perimeter of smaller trees that spans 4.5 ft.
What is the new inside perimeter in feet?



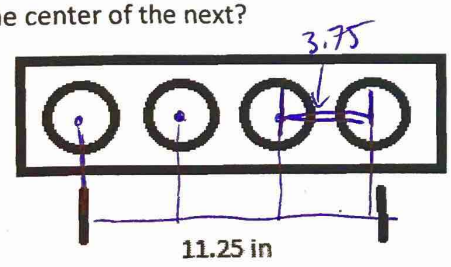
200 − (2 × 12.5) = 175

120 − (2 × 12.5) = 95

P = (2 × 175) + (2 × 95)

= 540 ft

3) The identical holes in this exhaust manifold are equally spaced. What is the distance from the center of one hole to the center of the next?



11.25 in ÷ 3 = 3.75

The distance is 3.75 inches.

4) A carpenter cuts boards that are 8.9 m long into 7 equal shelves. What is the length of each in centimeters?

8.9 m ÷ 7 = 1.27 m

1.27 m × 100 = 127 cm

5) A roll of tubing is 30 ft long. Abram needs to cut off equal pieces that are 2.2 m long. How many pieces will there be? What length of tubing will be left on the roll (in feet)?

30ft = 9m 1 foot = 0.3m

9m ÷ 2.2m = 4 (left over) 0.09

0.09 × 2.2 = 0.198m

0.198m = 0.3m / 1ft

0.66 ft

There will be 4 pieces with 0.66ft left.

6) How many $3\frac{1}{8}$ in lengths can Nathan cut from a 30 in piper? Is there leftover, if so how much?

$3\frac{1}{8}$ in = 3.125 in

30 ÷ 3.125 = 9.6

.6 in = $\frac{3}{5}$

Nathan can cut 9 lengths with 0.6 of an inch left.

7) Jessica buys 44.9 L of gas at a cost of $1.03 per liter. How much does it cost for the gas?

$\frac{\$1.03}{1L} = \frac{\$46.25}{44.9L}$

8) Adam walked 0.95 km to the golf course, then walked 6325 yds on the course, then home. How far did he walk all together?

KM

6325yd = 5.69 km 1 yd = 0.0009km

0.95km + 5.69km + 0.95 km = 7.59km

YDS

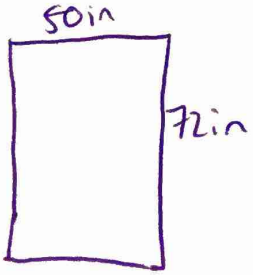
950m = 1055.56yd 0.9m = 1yd.

1055.56 + 6325 + 1055.56 = 8436.12 yd.

9) A triangle has a perimeter of 133.8 m, and has equal sides. How long is each side?

133.8m ÷ 3 = 44.6m

10) Kiara is making a display for a trade show. She plans to put a decorative border around the display board that is 72 in tall and 50 in wide. Borders come in packages of 30 ft. How much border will be left on the roll?



30ft = 360 in 1ft = 12in

perimeter = (2×50in) + (2×72in)

= 244 inches

roll → 360

− perimeter → −244

left over → 116in.

11) A cylinder grain bin has a base diameter of 20 ft. Jake sprays around the bin with round up to make his mowing easier. One jug of round up covers 60 linear feet. Does Jake need to refill or not?

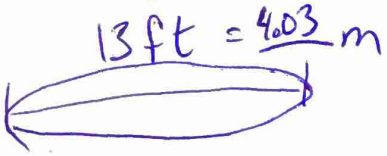
$C = d\pi$

$= 20ft \times \pi$

$C = 62.8\,ft$

Jake will need to refill

12) Jordan sets up the pool that has a 13 ft diameter. Then he walks around the outside to inspect that all looks well. He can cover 1m in one step. How many steps did he have to take?



Circumference $= \pi d$

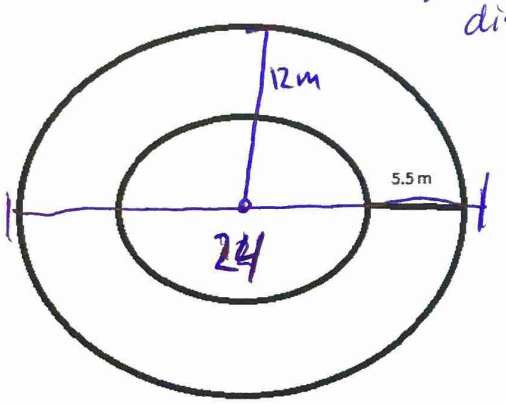
$= \pi \times 4.03m$

$= 12.66m$

(1 step = 1m).

Jordan will have to take 12.66 steps (round to 13)

13) What is the difference in circumference if the big circle has a 12 m radius?



small diameter: $24m - (2 \times 5.5) = 13m$

small $C = 13 \times \pi$

$= 40.8m$

big $C = 24m \times \pi$

$= 75.4m$

75.4

-40.8

34.6m

The difference is 34.6m.

Area

1) Estimate the area of your calculator in sq cm.

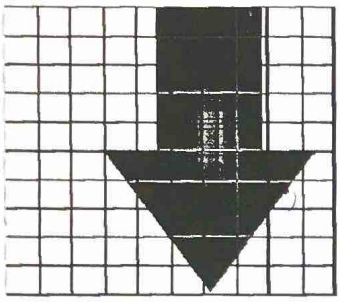
Various depending on calculator

2) What can be compared to 1 in^2?

An eraser.

Other various answer.

3) Estimate using the grid (1 sq ft)



17.5
+15.0
22.5

~ 22.5 sq. ft

4) Sally's drive way is 28 sq yd. It will cost $0.32 per sq foot to cover. How much will her driveway cost?

$\frac{3ft}{1yd} \rightarrow \frac{3^2 ft^2}{1^2 yd^2} = \frac{252 ft^2}{28 yd^2}$

252
× 0.32
$80.64

Sally's drive way will cost $80.64

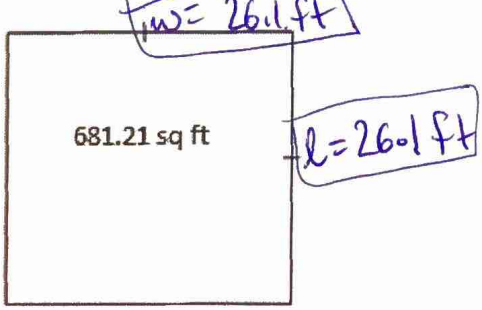
5) The area of a lake is 19,210 km². What is that in square miles?

$\frac{1 km}{0.62 mi} \rightarrow \frac{1 km^2}{0.62^2 mi^2} = \frac{19210 km^2}{73843 mi^2}$

6) Jordan plants 80 acres of corn. How many square meters did he plant?

$\frac{1 acre}{4046.86 m^2} = \frac{80 acre}{323748.8 m^2}$

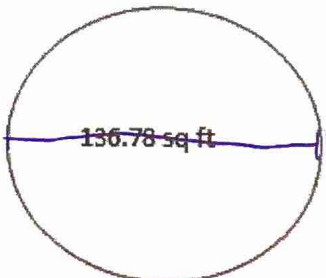
7) What are the dimensions of each stage? (LxW and diameter)



w = 26.1 ft

l = 26.1 ft

$\sqrt{681.21} = 26.1$



$136.78 = \pi r^2$

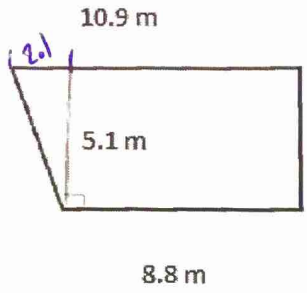
$\frac{136.78}{\pi} = \frac{\pi r^2}{\pi}$

$\sqrt{43.54} = \sqrt{r^2}$

$6.6 = r$

$d = 2 \times r$
$= 2 \times 6.6$
$= 13.2 ft$

8) Find the area of this living room.

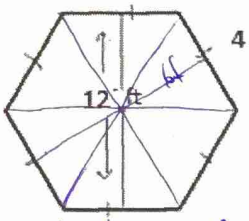


triangle = (b × h) ÷ 2
= (2.1 × 5.1) ÷ 2
= 10.71 ÷ 2
= 5.36 m²

Rectangle = b × h
= 8.8 × 5.1
= 44.88 m²

Total = triangle + rectangle
= 5.36 m² + 44.88 m²
= 50.24 m²

9) Helena wants to put more topsoil in her garden. It costs $1.08 per square meter (to cover the top 3 inches). How much will the garden cost to cover in topsoil?



6 ft = 1.8 m
4 ft = 1.2 m

6 triangles

1 triangle = (b × h) ÷ 2
= (1.2 m × 1.8 m) ÷ 2
= 2.16 ÷ 2
= 1.08 m²

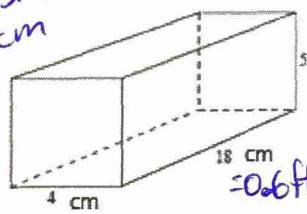
6 triangles → 1.08 m² × 6 = 6.48 m²

Cost = m² × $1.08
= 6.48 m² × $1.08
= 6.998
= $7.00

It will cost her $7.00 to topsoil.

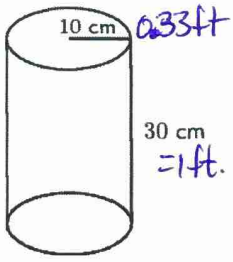
10) How much total wrapping paper will Erika need to buy to cover her three presents (sq ft)?

1 ft = 0.3 m
= 30 cm



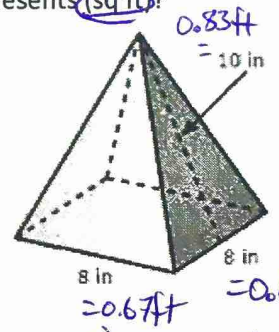
5 cm = 0.17 ft
18 cm = 0.6 ft
4 cm = 0.13 ft

SA = top/bot = (0.13 × 0.6) × 2 = 0.156 ft²
front back = (0.13 × 0.17) × 2 = 0.0442 ft²
left/right = (0.6 × 0.17) × 2 = 0.204 ft²
+
0.802 ft²



10 cm = 0.33 ft
30 cm = 1 ft.

Cylinder = top/bot = 2 × (π × 0.33²) = 0.684
side = π × 0.66 × 1 = 2.07
2.754 ft²



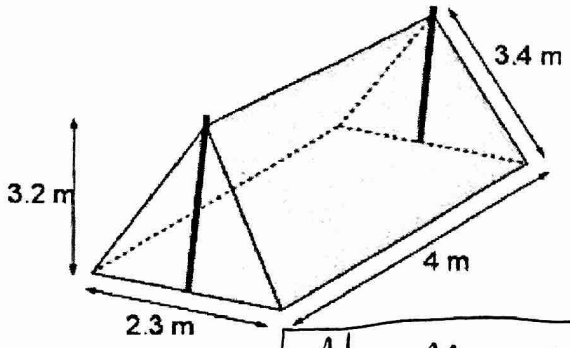
1 ft = 12 in
= 0.67 ft
= 0.67 ft

Pyramid.
Base = 0.67 × 0.67 = 0.4489
Sides = 4 × (0.83 × 0.67 / 2)
= 1.1122
+ 0.4489
1.5606 ft²

Total → 0.802
+ 2.754
+ 1.561
5.117 ft²

Erika will have to buy 5.1 ft² of wrapping paper!

11) Canvas material costs $1.30 per square meter. How much will it cost to build this tent?



triangles → $(3.2 \times 2.3) \div 2) \times 2 = 7.36 m^2$

bottom → $2.3 \times 4 = 9.2 m^2$

sides → $(3.4 \times 4) \times 2 = 27.2 m^2$

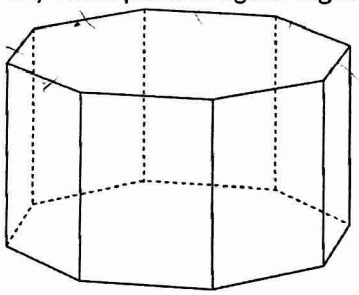
$43.76 m^2$

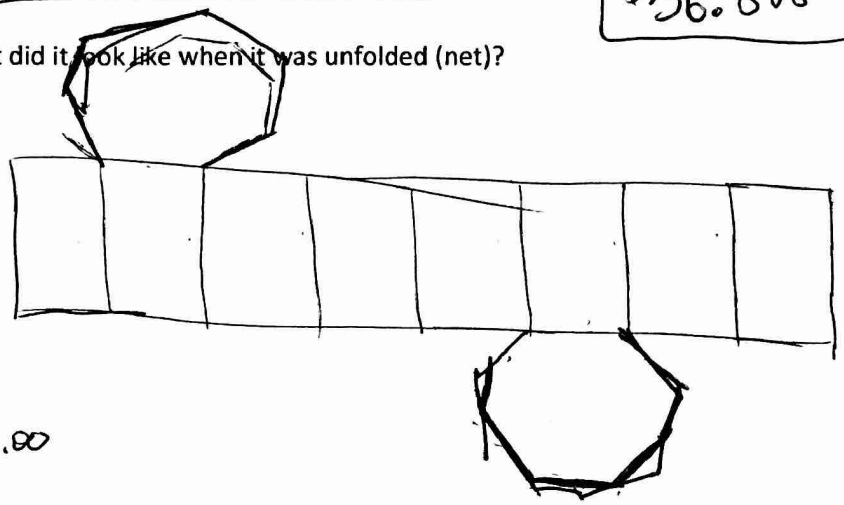
$\times \$1.30$

$\$56.888$

It will cost $\$56.89$ to build.

12) Mike put this figure together. What did it look like when it was unfolded (net)?





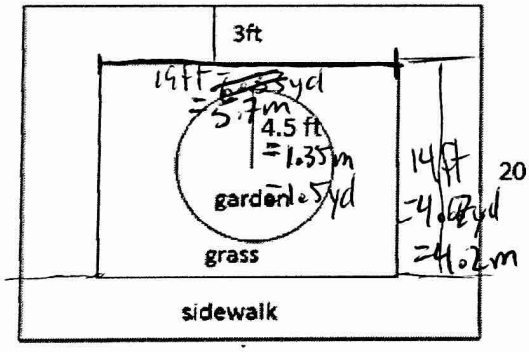
13) Calculate the cost:

$3/ sq ft to pour sidewalk cement $\$702.00$

$0.75/$m^2$ to plant grass $\$13.66$

$2.10/$yd^2$ to lay dirt for garden $\$14.85$

Note: It is symmetrical. The sidewalk is 3ft wide everywhere.



Grass area/cost (m^2)

rect. − circle

$(4.2m \times 5.7m) - (\pi 1.35^2) =$

$23.94m^2 - 5.73m^2 =$

$18.21m^2 =$

$\times 0.75$

$\$13.66$

dirt area/cost (yd^2)

area = πr^2

$= \pi (1.5)^2$

$= 7.07 yd^2$

$\times \$2.10$

$\$14.85$

side walk area/cost (ft^2)

$25 \times 3 \times 2 = 150 ft^2$

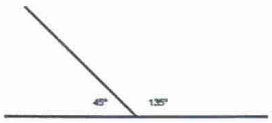
$14 \times 3 \times 2 = 84 ft$

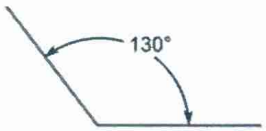
$234 ft^2 \times \$3 = \$702$

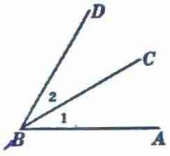
Angles and Parallel Lines

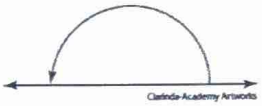
1) Match the following with a picture

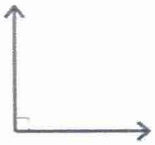
Acute angle j	Obtuse angle b	Right angles e	Reflex angle l
Straight angle d	Perpendicular lines h	Parallel lines k	Transversal line m
Alternating exterior angles i	Opposite angles g	Complementary o	Supplementary a
alternating interior angles n	Adjacent angles c	Corresponding angles f	

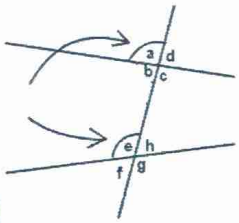
a) 

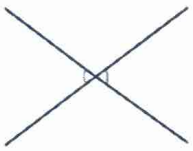
b) 

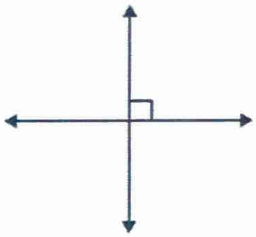
c) 

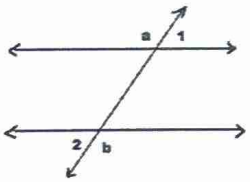
d) 

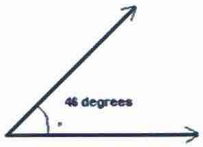
e) 

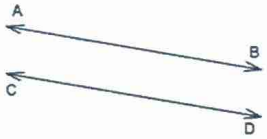
f) 

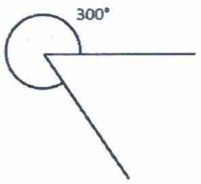
g) 

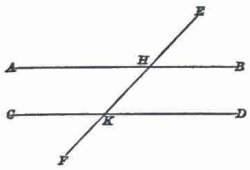
h) 

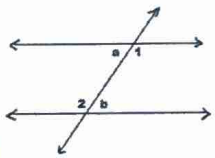
i) 

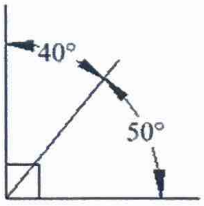
j) 

k) 

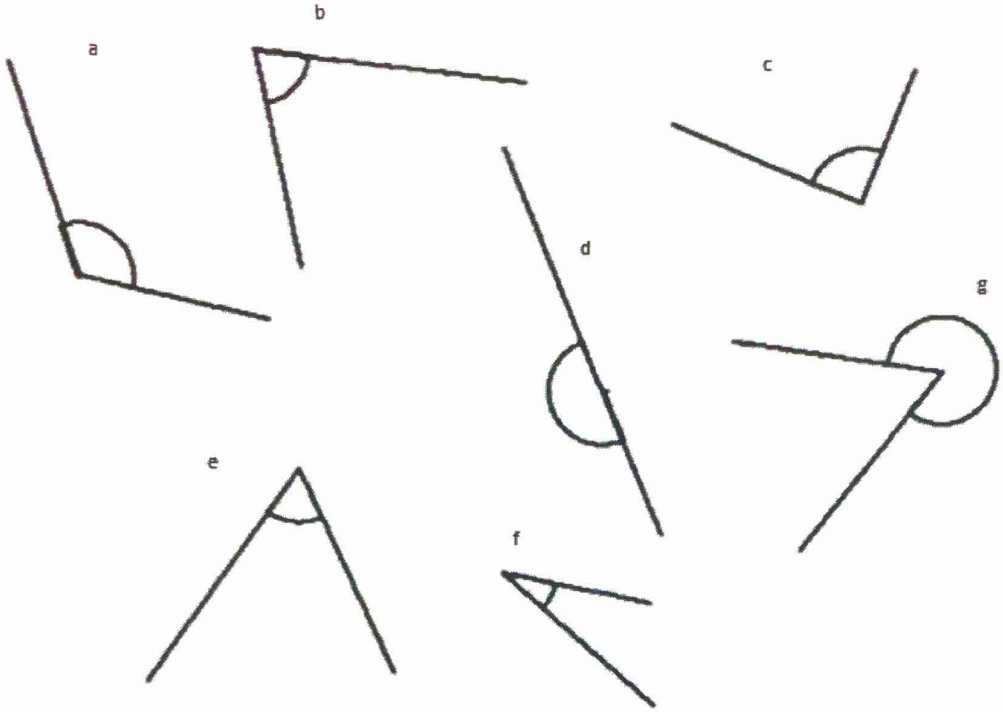
l) 

m) 

n) 

o) 

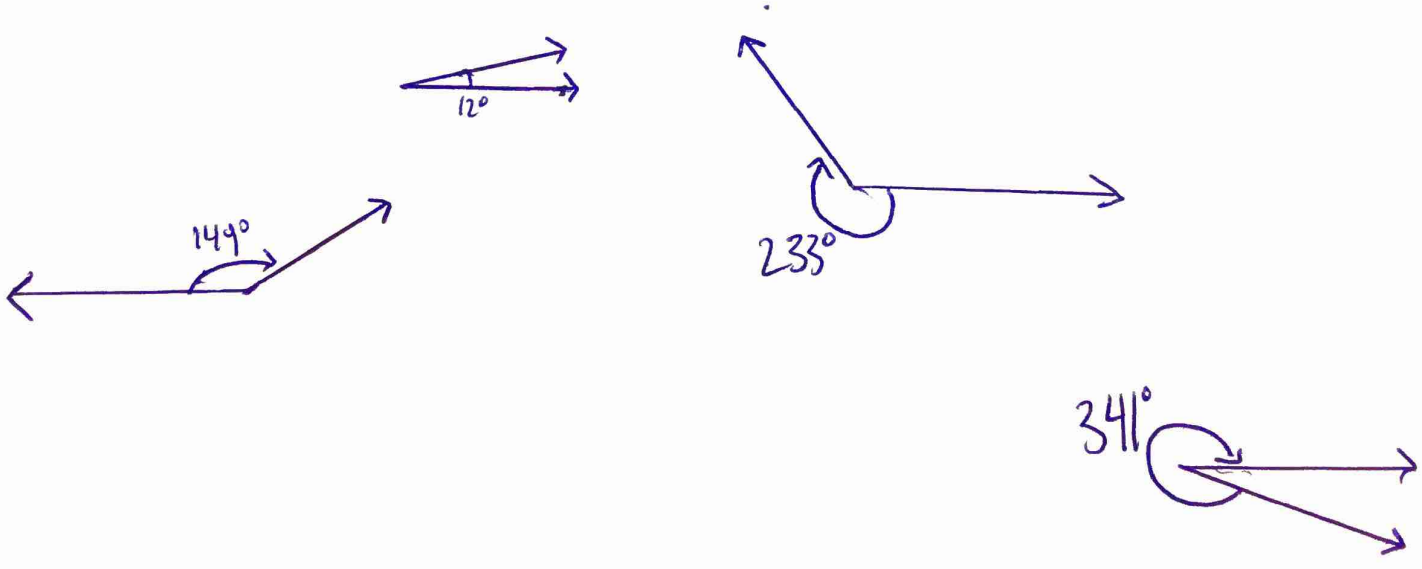
2) Estimate these angles first then measure their exact angle:



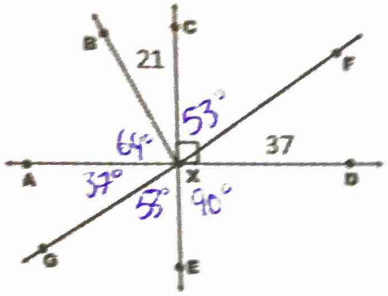
	a	b	c	d	e	f	g
estimate (various)							
measure	120°	72°	90°	180°	60°	30°	300°

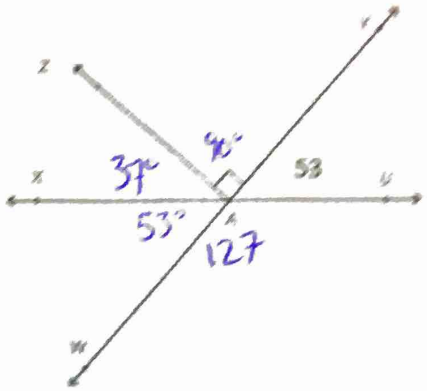
3) Draw the following angles:

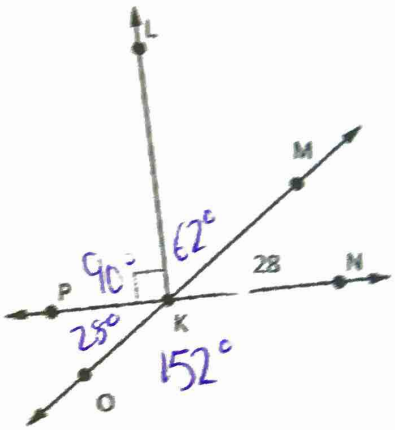
149° 12° 233° 341°

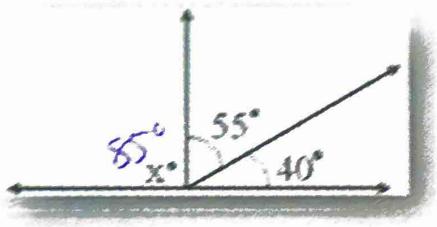


4) Find all the missing angles







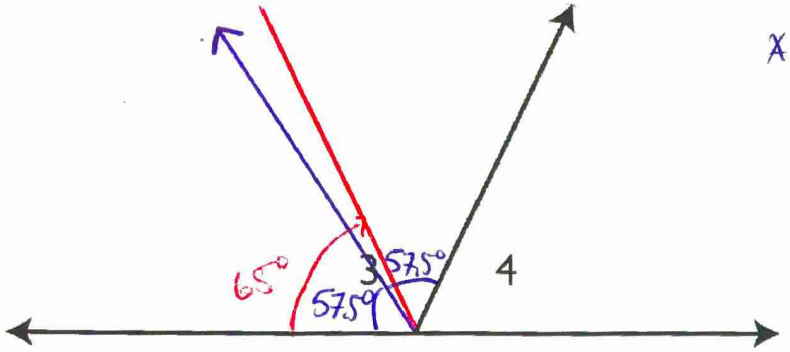


5) Bisect the obtuse angle and replicate the acute one

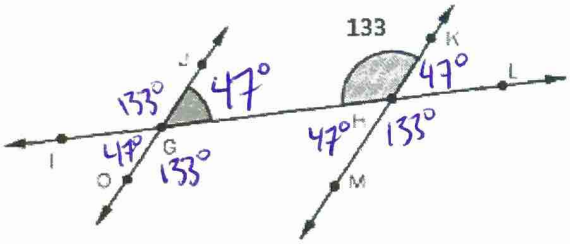
*Picture on next page!

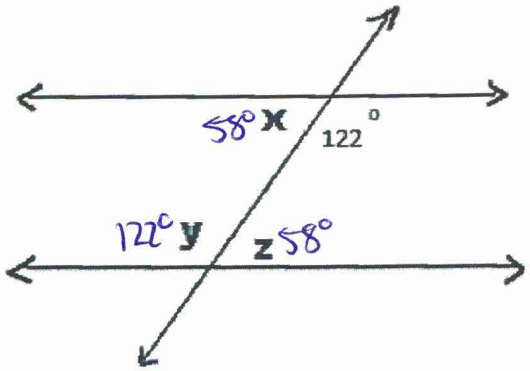
* Bisect obtuse → 115 ÷ 2 = 57.5°

* Replicate acute → replicat 65°

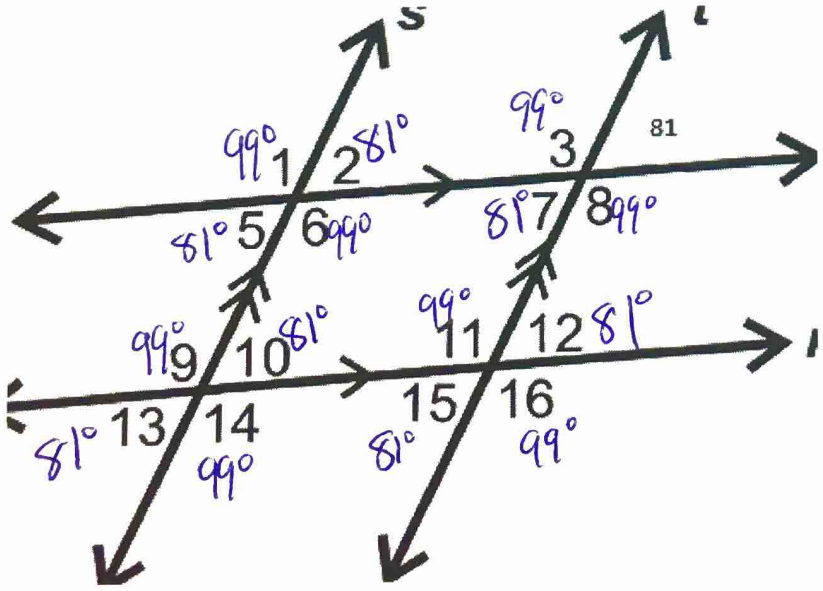


6) Calculate the missing angles (in each problems there are parallel lines with a transversal through)



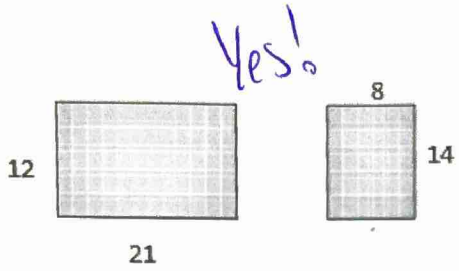


7) Find all the missing angles



Similar Figures

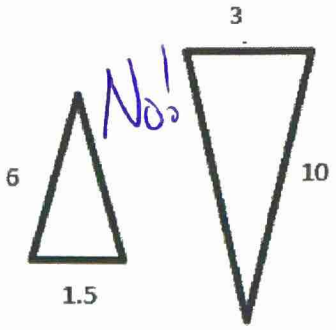
1) Are the following figures similar? If so mark all corresponding angles.



Yes!

$\frac{8}{12} = 0.6\overline{6}$ Equal = yes

$\frac{14}{21} = 0.6\overline{6}$



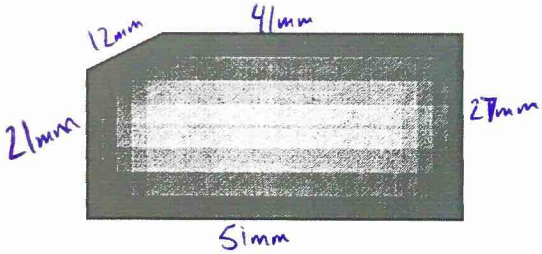
No!

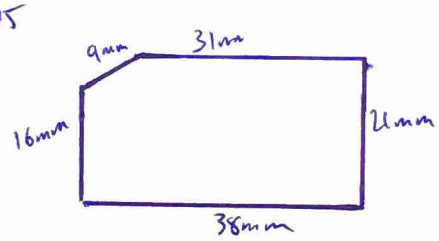
$\frac{1.5}{3} = 0.5$ Not equal = No

$\frac{6}{10} = 0.6$

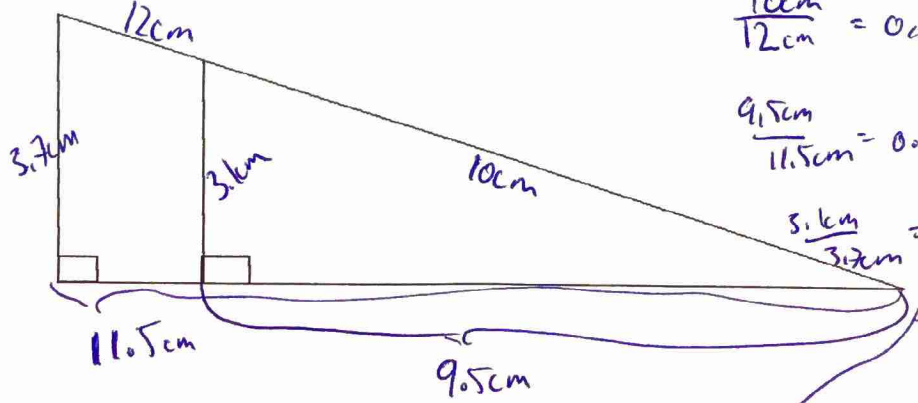
2) Draw a similar figure with a 0.75 scale factor, include all measurements.

$12 \times 0.75 = 9$
$41 \times 0.75 = 30.75$
$27 \times 0.75 = 20.25$
$51 \times 0.75 = 38.25$
$21 \times 0.75 = 15.75$





3) Measure the sides of the two similar triangles. Determine the scale factor (from big to small)



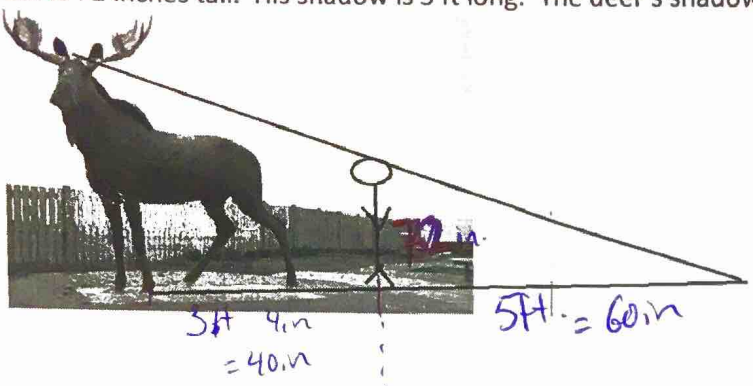
$\frac{10cm}{12cm} = 0.833$

$\frac{9.5cm}{11.5cm} = 0.83$

$\frac{3.1cm}{3.7cm} = 0.838$

The scale factor is 0.83.

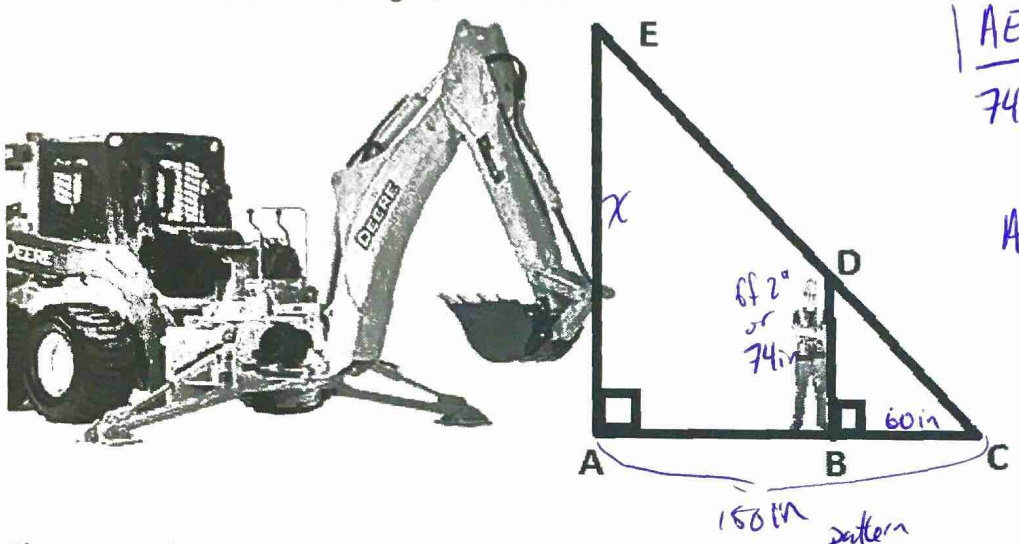
4) Jim is standing by the deer statue is Tantallon, Sk. How tall is the statue?
Jim is 72 inches tall. His shadow is 5 ft long. The deer's shadow is 8 ft 4 in long.



$$\frac{72in}{x} = \frac{60in}{100in}$$

x = height of statue
= 120in or 10ft

5) Mike operates a backhoe and wants to know how tall it is. ($AE = x$)
The distance from A to C is 150". The distance from B to C is 60". Mike is 6'2" tall.
What is the scale factor? How high is the backhoe?



$$\frac{AE}{74in} = \frac{150in}{60in}$$

AE = height of backhoe
= 185 inches
= 15ft 5in.

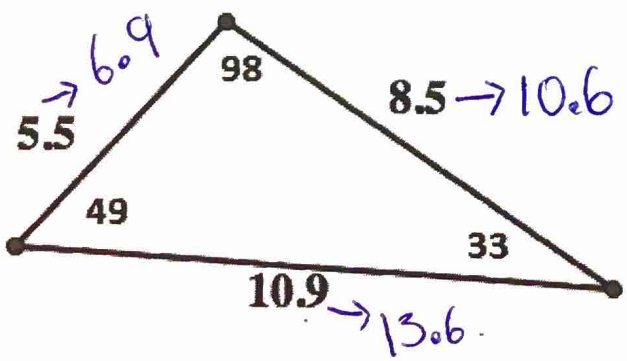
* 6) Lana is making a pattern to sew onto her costume for dance. Her fabric is 12 cm x 25 cm. She wants to reduce the pattern, becoming 6/10ths of the original size. What is the new dimension of her pattern?

$12cm \times \frac{6}{10} = 7.2cm$

$25cm \times \frac{6}{10} = 15cm$

New dimensions = 7.2cm x 15cm

7) What would a triangle with a scale factor of 125% have with side and angle measurements?



$5.5 \times 1.25 = 6.9$

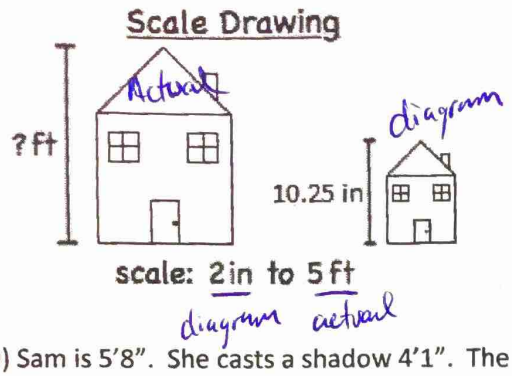
$8.5 \times 1.25 = 10.6$

$10.9 \times 1.25 = 13.6$

$125\% \div 100 = 1.25$ ← 125% as a decimal.

* All angles would be the same!

8) These two homes are similar. The first house in the actual one. The second house is the scale drawing. Use the scale to find the actual height of the real house.

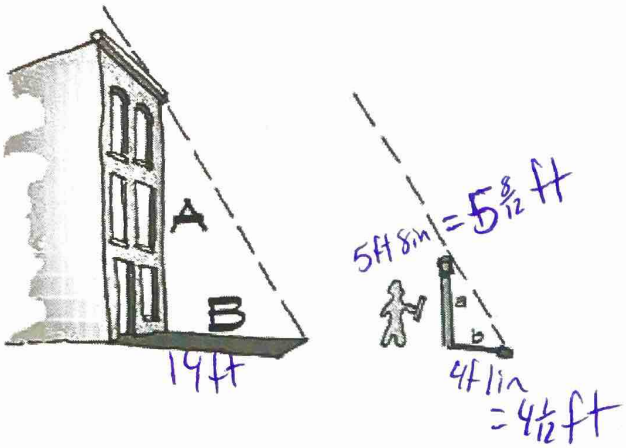


$$\frac{2\text{ in}}{5\text{ ft}} = \frac{10.25\text{ in}}{x}$$

x = height of real house in ft

$= 25.6$ ft

9) Sam is 5'8". She casts a shadow 4'1". The building casts a shadow that is 19'. What is the height of the building?



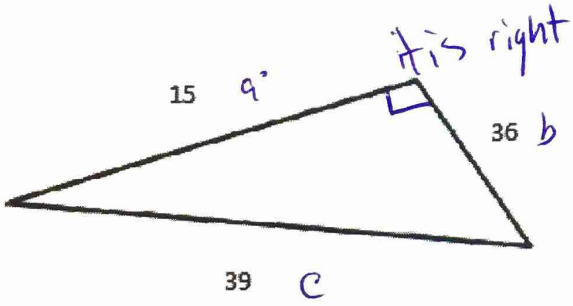
$$\frac{x}{5\frac{8}{12}\text{ ft}} = \frac{19\text{ ft}}{4\frac{1}{12}\text{ ft}}$$

x = height of building in ft

$= 26.37$ ft or 26 ft 4.5 inches.

Trigonometry

1) Determine if the following are right triangles or not. Does it follow pythagorean theorem.



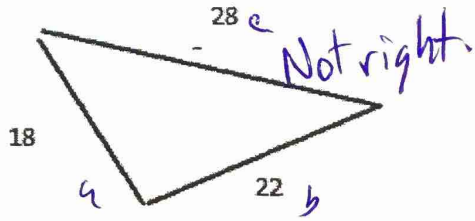
This is right.

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

$15^2 + 36^2 = 39^2$

$225 + 1296 = 1521$

$1521 = 1521$ ✓



Not right.

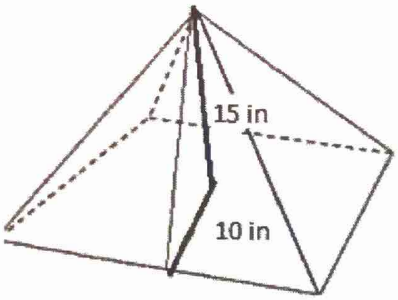
$a^2 + b^2 = c^2$

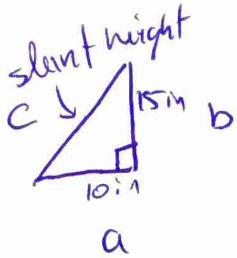
$18^2 + 22^2 = 28^2$

$324 + 484 = 784$

$808 \neq 784$ X

2) Dorothy needs to know the slant height before calculating the area of this pyramid. The pyramid is 15 in high and the distance to the center is 10 in.





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

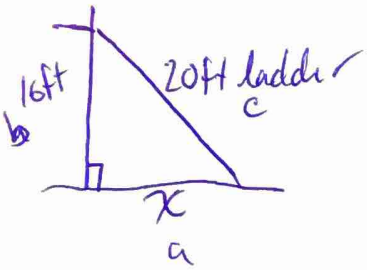
$\sqrt{a^2+b^2} = c$

$\sqrt{10^2+15^2} = c$

$18.03 = c$

slant height is 18 in

3) You leaned a 20 ft ladder 16 ft up the wall. How far is the ladder base away from the wall?



$a^2 = c^2 - b^2$

$a = \sqrt{c^2 - b^2}$

$= \sqrt{20^2 - 16^2}$

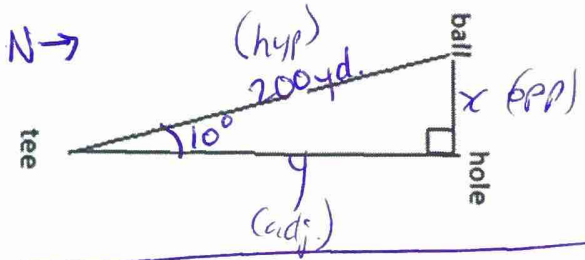
$= 12$

The ladder is 12 ft away from the base of the wall

4) Arthur wanted to hit the ball directly north, but hit the golf ball 10 degrees off course and it travelled 200 yd, and landed directly west of the hole.

a) How far is the golf ball from the hole? $x = ?$

b) How far is the hole from the tee? $y = ?$



a) SOH

$\sin 10 = \frac{x}{200\text{yds}}$

$200\text{yds} \times \sin 10 = x$

$34.7\text{yds} = x$

b) CAH

$\cos 10 = \frac{y}{200\text{yds}}$

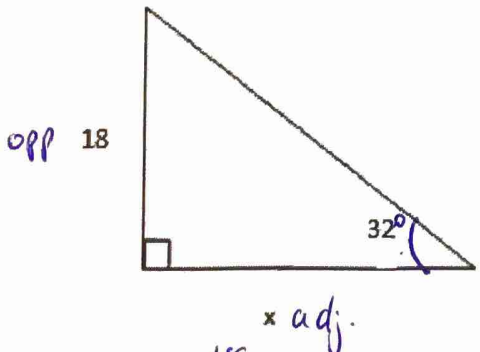
$200\text{yds} \times \cos 10 = y$

$197\text{ yds} = y$

The ball is 37.7 yds west of the hole.

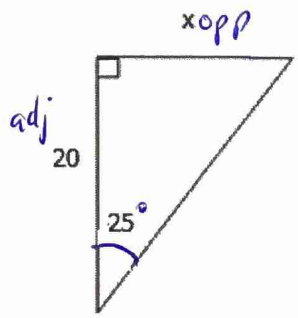
The tee is 197 yds from the hole.

5) Find the missing side.



$\tan 32 = \frac{18}{x}$

$x = \frac{18}{\tan 32} = 28.8$

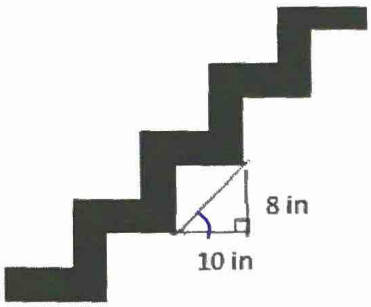


$\tan 25 = \frac{x}{20}$

$20 \times \tan 25 = x$

$9.3 = x$

6) The steppest code that stairs can be is 8in of rise for each 10in run. What is the steepest angle the stairs can be?



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

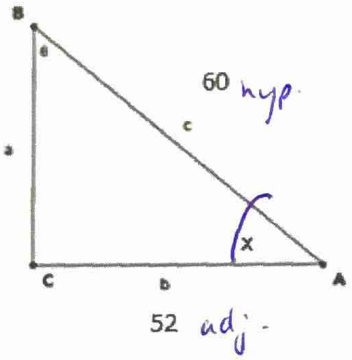
$\tan A = \frac{8}{10}$

$A = \tan^{-1}\left(\frac{8}{10}\right)$

$A = 38.7°$

The steepest angle is 38.7°.

7) Find angle x.

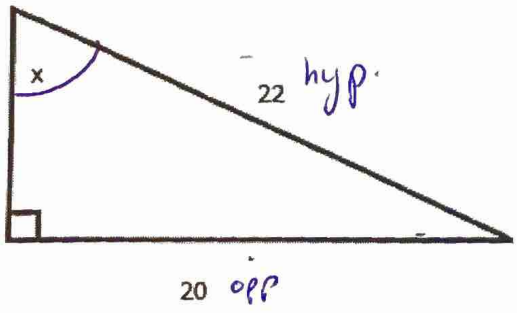


$\cos x = \frac{52}{60}$

$x = \cos^{-1}\left(\frac{52}{60}\right)$

$x = 29.9°$

8) Find the indicated angle



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

$\sin x = \frac{20}{22}$

$x = \sin^{-1}\left(\frac{20}{22}\right)$

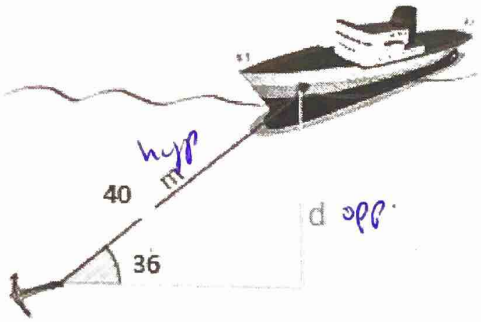
$x = 65.4°$

9) A boat drops a 40 m long achor. It is on a 36 degree angle to the boat. How deep is it to the bottom of the lake?

*Picture on next page!

*Work on next page!

Bottom of the lake is 23.5m deep.



$\sin 36 = \frac{opp}{hyp}$

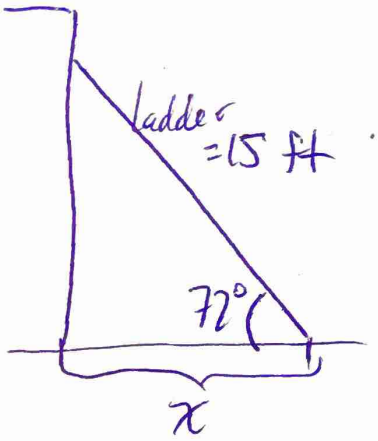
$\sin 36 = \frac{d}{40}$

$40 \times \sin 36 = d$

$23.5 = d$

10)

A ladder that is 15 ft is leaning against the side of a building. If the angle formed between the ladder and ground is 72°, how far will Coach Jarvis have to crawl to get to the front door when he falls off the ladder (assuming he falls to the base of the ladder)?



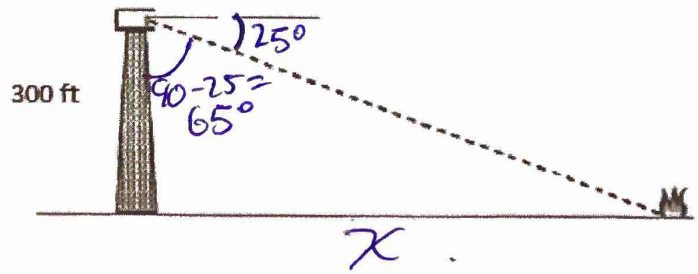
$\cos 72 = \frac{x}{15}$

$15 \times \cos 72 = x$

$4.6 \text{ ft} = x$.

Coach Jarvis will have to crawl 4.6ft.

11) From the top of a 300 ft lookout tower, George looks down at a 25 degree angle of depression and see a fire. How far from the tower is the fire?



$\tan 65° = \frac{x}{300 \text{ ft}}$

$300 \times \tan 65 = x$

$643.4 = x$

The tower is 643.4 ft from the fire.