Math 10 Midterm review #4

1. Simplify $(5x^7y^{-3})^2$

$5^2 \cdot x^{14} y^{-6}$

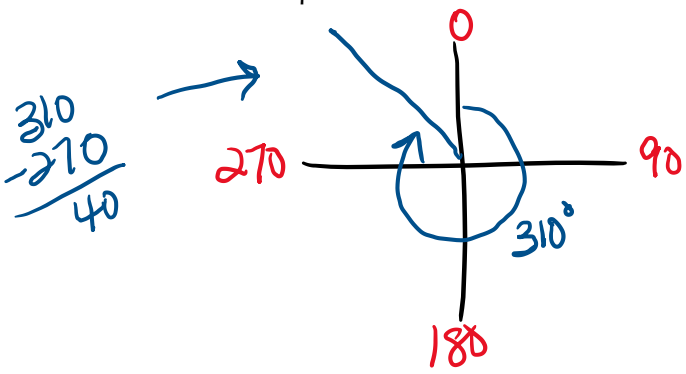
$25 x^{14} y^{-6}$

$\frac{25x^{14}}{y^6}$

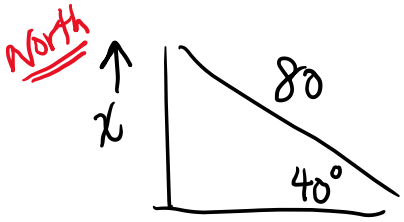
Power law → to remove brackets by mult. all exponents by 2

Negative exponent law – move all powers with neg. exponents by reciprocating

2. If a plane travels for 80 km on a bearing of 310, how far North did the plane travel?



$310 - 270 = 40$



$\sin 40 = \frac{x}{80}$

$80 \sin 40 = x$

$51.4 \text{ km} \doteq x$

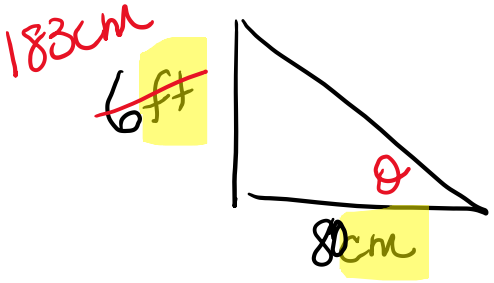
3. Simplify: $3(x+4)(x-7)$

$(3x+12)(x-7)$

$3x^2 - 21x + 12x - 84$

$3x^2 - 9x - 84$

4. What is the angle of elevation of the sun when a 6 ft person casts an 80 cm shadow?



$1 \text{ ft} = 30.5 \text{ cm}$

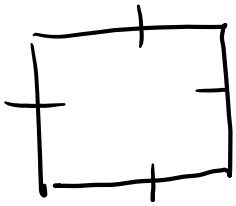
$\therefore 6 \text{ ft} = 183 \text{ cm}$

$\tan \theta = \frac{183}{80}$

$\theta = \tan^{-1}\left(\frac{183}{80}\right)$

$\theta \doteq 66°$

5. A square has a perimeter of **(8x – 12)**, write an expression for its area?



$P = 8x - 12$

$\therefore$ one side $= \frac{8x-12}{4}$

side $= 2x - 3$

$\therefore$ Area $= s^2$

$= (2x-3)^2$

$= (2x-3)(2x-3)$

$A = 4x^2 - 12x + 9$

6. List all the groups each number belongs: rational, irrational, real, natural, whole, integer

a. 6 Q, R, N, W I
b. ½ Q, R
c. -2.8 Q, R
d. $\sqrt{90}$ Q, R

7. Factor completely:

$x^2 + 10x + 16$ $(x+8)(x+2)$
$2x^2 + 10 \rightarrow 2(x^2+5)$
$x^2 - 64 \rightarrow (x-8)(x+8)$
$2x^2 + 16x + 30 \rightarrow 2(x^2+8x+15) \rightarrow 2(x+3)(x+5)$

8. Determine the x and y intercepts for the relation $3x - 5y = 12$

x-int $(x, 0)$

$3x - 5y = 12$
$3x = 12$
$x = 4$

$(4, 0)$

y-int $(0, y)$

$3x - 5y = 12$
$-5y = 12$
$y = \frac{12}{-5}$

$(0, -12/5)$ or $(0, -2.4)$

9. What is the algebraic rule for the following relation: 7, 4, 1, ... ? Is -66 a number in this pattern?

x	y
1	7
2	4
3	1

(-3, -3)

$\rightarrow y = -3x + 10$

is -66 an output?

$-66 = -3x + 10$
$-10 \quad -10$
$-76 = -3x$
$\frac{-76}{-3} = \frac{-3x}{-3}$
$+25\frac{1}{3} = x$

NO not in pattern

otherwise x would be a whole #.

10. What is the difference between a whole number and an integer? What is similar?