

Final Homework: Round 1

Math 1 1. $2x^2 - 72$

Review

$$2(x^2 - 36) = 2(x+6)(x-6)$$

(D)

Math 1 2. Area = $(3x+5)(3x+5)$

Review

$$= 9x^2 + 15x + 15x + 25$$

$$= 9x^2 + 30x + 25$$

Perimeter = $4(3x+5)$

$$= 12x + 20$$

$$\text{Area} - \text{Perimeter} = 9x^2 + 30x + 25 - (12x + 20)$$

$$= 9x^2 + 30x + 25 - 12x - 20$$

$$= 9x^2 + 18x + 5$$

(A)

Math 1 3. Jessica = $15 - 3x$

$$15 - 3x + 27 - 5x$$

Review

$$\text{Levi} = 27 - 5x$$

$$= 42 - 8x$$

(D)

Math 1 4. $4x^2 - 121 = (2x-11)(2x+11)$

Review

(B)

Math 1 5. $4t^2 - 16 = 4(t^2 - 4) = 4(t+2)(t-2)$

Review

(C)

Quadratics 6. $x^2 + 12x + 27$

Larger zero is -3

$$(x+9)(x+3)$$

(C)

$$x+9=0 \quad x+3=0$$

$$x=-9 \quad x=-3$$

Quadratics 7. $x^2 + 4x - 252$

$$\begin{array}{r} \cancel{-252} \\ 18 \quad \cancel{4} \quad \cancel{-14} \\ \quad \quad \quad 4 \end{array}$$

$$x+18=0$$

$$x=-18$$

$$x-14=0$$

$$x=14$$

(C)

8. $x^2 + 9x + 14$

$(x+7)(x+2)$

$x = -7 \quad x = -2$

(A) quadratics

9. $y_1 = 80x - 16x^2$

$y_2 = 0$

(B) quadratics

Find intersection

10. $y_1 = -16t^2 + 84t$

Max height = 110.25 ft

(C)

Max height

2nd → Trace → Max

↑ vertex ↑ y-value

quadratics

11. $d = rt \quad t = 26.2$

(D)

Variation

$26.2 = st$

S

12. $y_1 = x^2 + 2x + 8$ → Find intersections

$(-2, 8)$ and $(-4, 16)$

$y_2 = -4x$

(C)

↑ smallest y

quadratics

Final Homework: Round 2

Math 1 Review 1. $y\text{-int} = 2$ $>$ dotted line, shaded above
slope = $-\frac{3}{1}$ (C)

Math 1 Review 2.

$$2x - 2y \leq 6$$

$$-2y \leq -2x + 6$$

$$y \geq x - 3$$

↑
shade above

$$4x + 3y > 9$$

$$3y > -4x + 9$$

$$y > -\frac{4}{3}x + 3$$

↑
shade above

(B)

Math 1 Review 3. Vertical line test

Review

(C)

Math 1 Review 4. $x - y = 1 \rightarrow -2x + 2y = -2$

Review

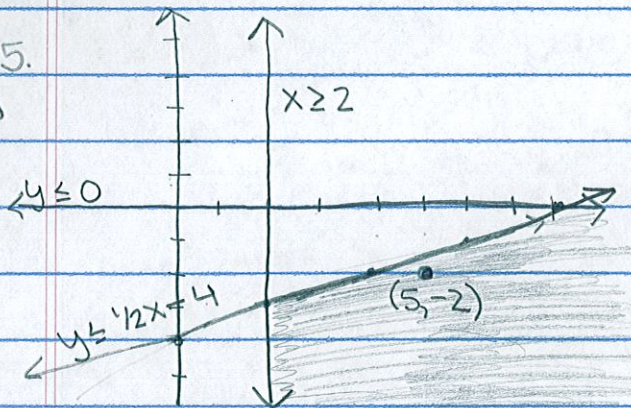
$$3x - 2y = 9 \rightarrow 3x - 2y = 9$$

$$x = 7$$

(B)

Math 5.

1 Review



(C)

6. $t = \text{time} \rightarrow$ (D)

Exponentials

* cannot be zero \rightarrow exclude A & C

* cannot be negative

Math 1

Review

integers are just whole numbers

7. $y = a(1+r)^t$

$y = 15(1+0.0275)^t$

$y = 15(1.0275)^t$

I graphed the equation, then compared the solutions to the table

(D)

exponentials

8. A → linear

B → linear

(C)

Exponentials & Math 1 Review

C → increasing by a rate = exponential!

D → constant

9. $(3x^5 + 17x^3 - 1) + (-2x^5 - 6)$

Math 1 Review

$3x^5 + 17x^3 - 1 + -2x^5 - 6$

$x^5 + 17x^3 - 7$

(A)

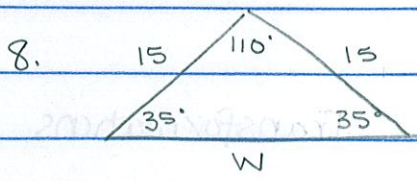
10. Graph & compare

Exponentials & Math 1 Review

(A)

Final Homework: Round 3

1. Isometries = same size, same shape (D) Transformations
2. $\tan 30 = \frac{x}{150}$ $x = 150 \tan 30$ (A) Trigonometry
 $x = 86.6 \text{ ft}$
3. $V_s = \frac{Kx^2}{2}$ $K = \frac{2V_s}{x^2}$ (A) Math 1 Review
 $\frac{2V_s}{x^2} = \frac{Kx^2}{x^2}$
4. $\cos 28 = \frac{y}{5}$ $y = 5 \cos 28$ (A) Trigonometry
5. $\triangle SKL \cong \triangle CFG$ order matters! (C) Triangles/congruency
6. $x + y = 180$ $128 + y = 180$ (D) Math 1 Review
 $x - y = 76$ $y = 52^\circ$
 $2x = 256$
 $x = 128^\circ$
7. $V = \frac{Bh}{3}$ $V = \frac{(36)(9)}{3}$ (C) Volume
 $B = \text{area of base}$ $V = 108 \text{ in}^3$
 $B = (6)(6) = 36$



8. $\frac{\sin 110}{W} = \frac{\sin 35}{15}$ $W = \frac{15 \sin 110}{\sin 35}$

$15 \sin 110 = W \sin 35$ $W = 24.57$

(B)

9. $V = \frac{4\pi r^3}{3}$ $523 = \frac{4(3.14)r^3}{3}$ $r^3 = 124.92$ $r = 4.99$ (A)

$r = \sqrt[3]{124.92}$ Volume

$1569 = 12.56r^3$

10. $V = \pi r^2 h$ $254 = (3.14)(9)r^2$ $r = 2.99$ (C) Volume

$254 = 28.26r^2$ $d = 6$

$r^2 = 8.98$

Final Homework: Round 4

1. $x + y = 24$ $x^2 + y^2 = 306$ $(15)(9) = 135$

$x = 24 - y$ $(24 - y)^2 + y^2 = 306$

$(24 - y)(24 - y) + y^2 = 306$ (C)

$576 - 48y + y^2 + y^2 = 306$

$2y^2 - 48y + 576 = 306$

$2y^2 - 48y + 270 = 0$

$y^2 - 24y + 135 = 0$

$(y - 15)(y - 9) = 0$

$y = 15$ $y = 9$

2. Graph, look for 1 intersection (B)

3. Square a neg/positive = positive, so 1st equation doesn't matter. I would just plug & chug solutions into 2nd equation to save time

a) $9 - 7(12) = -75$

$-75 = -75$ (A)

$-12 - 7(9) = -75$

$-75 = -75$

4. $(7m^2 + 14m)(-tm - 2t)$

$7m(m+2) - t(m+2)$ (C)

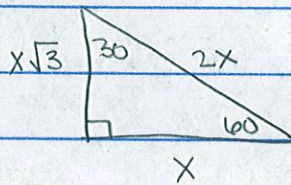
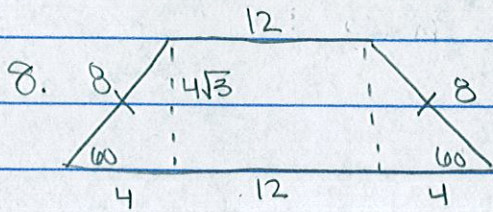
$(7m - t)(m + 2)$

$$5. \left(\frac{16x^{\frac{1}{6}}y^{-2}}{x^{-1/6}y^6} \right)^{3/2} = \frac{16^{3/2} x^{3/2} y^{-3}}{x^{-3/2} y^9} = \frac{64 x^{3/2} X^{3/2}}{y^9 y^3} = \frac{64 X^{1/2}}{y^{12}} \quad \text{(D)}$$

$$6. \begin{aligned} 2x+3 &= 0 & x-2 &= 0 \\ 2x &= -3 & x &= 2 \\ x &= -3/2 & x &= 2 \end{aligned} \quad \text{(A)}$$

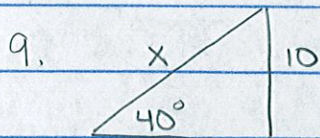
Faces up.

$$7. \tan 20 = \frac{60}{x} \quad \text{(C)}$$



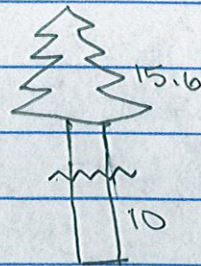
$$A = \frac{h(b_1 + b_2)}{2}$$

$$A = \frac{(12 + 20)4\sqrt{3}}{2} = 110.85 \text{ cm}^2 \quad \text{(B)}$$



$$\sin 40 = \frac{10}{x}$$

$$x = \frac{10}{\sin 40} = 15.6$$



25.6 ft

(D)

$$10. \ 50 \left(\frac{2}{3} \right) = \frac{100 - r}{3}$$

$$V = \frac{4(3.14) \left(\frac{100}{3} \right)^3}{3} = 155061.7 = 1.55 \times 10^5 \quad \text{(B)}$$

Final Homework: Round 5

$$\begin{aligned} 1. \quad 6x + 4y &= 104 \rightarrow 6x + 4y = 104 \\ x + y &= 21 \rightarrow -4x - 4y = -84 \quad (C) \\ x &= \text{adult} & 2x &= 20 \\ y &= \text{child} & x &= 10 \end{aligned}$$

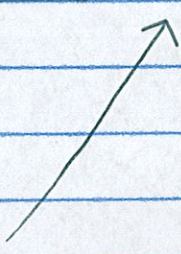
$$2. \quad \frac{-14a^2c^8}{7a^3c^2} = \frac{-2c^6}{a} \quad (D)$$

$$3. \quad \left(\frac{25x^{\frac{1}{2}}y^{-4}}{x^{-1/2}y^6} \right)^{\frac{1}{2}} = \frac{25^{\frac{1}{2}}x^{\frac{1}{4}}y^{-2}}{x^{-1/4}y^3} = \frac{5x^{1/4}x^{1/4}}{y^3y^2} = \frac{5x^{1/2}}{y^5} \quad (A)$$

$$4. \quad y = 2x^2 + 4x - 6 \\ x = \frac{-4}{2(2)} = \frac{-4}{4} = -1 \quad (B)$$

$$5. \quad y = kx \quad 18 = 6k \quad y = 3x \quad (B) \\ k = 3$$

$$6. \quad y = \frac{k}{x} \quad \frac{1}{3} = \frac{k}{-3} \quad k = -1 \quad y = \frac{-1}{9} \quad (C)$$

$$7. \quad A = \frac{4x(x^2 + 2 + 3x^2 + 2x - 4)}{2} \quad A = 8x^3 + 4x^2 - 4x \\ A = \frac{4x(4x^2 + 2x - 2)}{2} \quad (C) \\ A = \frac{16x^3 + 8x^2 - 8x}{2}$$


$$8. \quad 5x+7+8x^2-4x+?=10x^2-6x+1$$

$$8x^2+1x+7+?=10x^2-6x+1 \quad \text{(B)}$$

$$\underline{-8x^2-1x-7} \quad \quad \quad -8x^2-1x-7$$

$$?=2x^2-7x-6$$

$$9. \quad P(x) = -5x^2 + 300x + 15000 \quad \text{Max: } (30, 19500)$$

Maximum = vertex

price = \$30

$$\text{Profit} = y$$

$$\text{Price} = x$$

(B)

$$10. \quad x^2 - 6x + 8$$

$$(x-4)(x-2)$$

$$x=4 \quad x=2$$

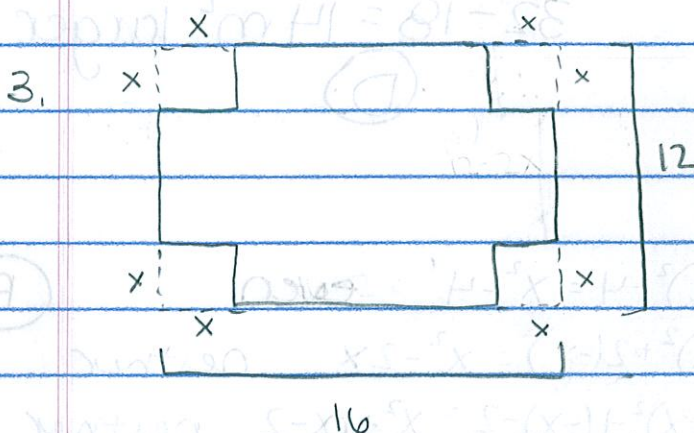
(C) ← quick tip: the equation in C is the same as the original, just multiplied by 2. They will have the same solutions!

Final Homework: Round 6

1. $t = \frac{nK}{x}$ $3 = \frac{12K}{6}$ $5.25 = \frac{28(1.5)}{x}$ (C)

$18 = 12K$ $x = \frac{28(1.5)}{5.25} = 8$ trees
 $K = 1.5$

2. $F = \frac{K}{r^2}$ $8.2 = \frac{K}{(0.04)^2}$ $K = 0.2(0.04)^2$ $F = \frac{3.35872}{(0.77)^2} = 5.6$ (B)



Area of paper = $(12)(16) = 192$
 # of squares = 4
 Area of squares = x^2 } $4x^2$

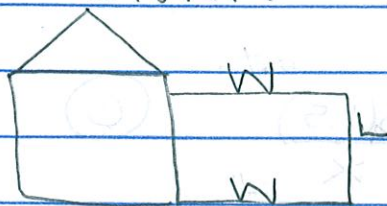
Area = $192 - 4x^2$ (D)

4. $y = P(1+r)^t + 150$ (D)
 $y = 2000(1+0.032)^t + 150$
 $y = 2000(1.032)^t + 150$

5. $h = 2w$ (A) $50 + 10(2w^2) = 2050$
 $w = w$ $50 + 20w^2 = 2050$
 $A = (2w)(w) = 2w^2$ $20w^2 = 2000$

$w^2 = 100$
 $w = 10$ (D)
 height = 20

6. Brown



$$12 = 2W + L$$

$$L = 12 - 2W$$

$$\text{Area} = LW$$

$$\text{Area} = W(12 - 2W)$$

$$\text{vertex} = (3, 18)$$

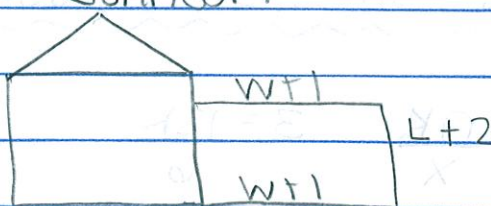
$$\text{width} = 3 \text{ m}$$

$$\text{Length} = 12 - 2(3) = 6 \text{ m}$$

$$\text{Area} = 18 \text{ m}^2$$

graph, find vertex (x, y) width max area

Johnson



$$\text{width} = 3 + 1 = 4 \text{ m}$$

$$\text{Length} = 6 + 2 = 8 \text{ m}$$

$$\text{Area} = (4)(8) = 32 \text{ m}^2$$

$$32 - 18 = 14 \text{ m}^2 \text{ larger}$$

(D)

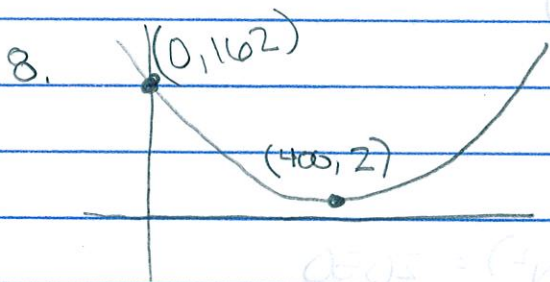
7. a) $f(x) = x^2 - 4 \rightarrow f(-x) = (-x)^2 - 4 = x^2 - 4$ even

(A)

b) $f(x) = x^2 + 2x \rightarrow f(-x) = (-x)^2 + 2(-x) = x^2 - 2x$ neither

c) $f(x) = x^2 - 1x - 2 \rightarrow f(-x) = (-x)^2 - 1(-x) - 2 = x^2 + 1x - 2$ neither

d) $f(x) = x^2 - 2x + 1 \rightarrow f(-x) = (-x)^2 - 2(-x) + 1 = x^2 + 2x + 1$ neither



$$y = 0.001(x - 400)^2 + 2$$

$$y = 0.001(120 - 400)^2 + 2$$

$$y = 80.4 \text{ feet}$$

(A)

$$y = a(x - 400)^2 + 2$$

$$1602 = a(0 - 400)^2 + 2$$

$$1600 = 160000a$$

$$a = 0.001$$

9. $(8W^7 X^{-5} Y^3 Z^{-9})^{-2/3} = 8^{2/3} W^{-14/3} X^{10/3} Y^{-2} Z^6$

$$= \frac{1 X^{10/3} Z^6}{4 W^{14/3} Y^2} \quad (A)$$