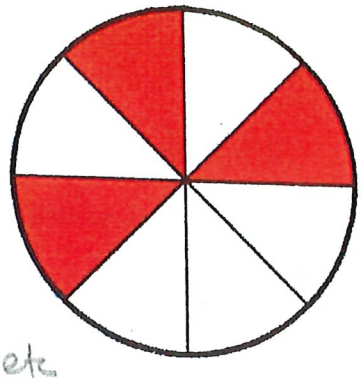
Key

Final TMath 171 Winter 2026

As a reminder, you are welcome to use a non-internet accessing calculator (which includes Desmos Test Mode) and one 2-sided 8.5 in by 11 in sheet of notes.

1. Consider the shaded part of the whole shown on the right.



   (a) [2] (FactionsActivity #1) Find a fraction for the shaded part of the whole.

notation (+.5)

$$\frac{\text{shaded part}}{\#\text{ of parts to whole}} = \frac{3}{8}$$ (+.5) (+1)

   (b) [3] (§5.2 #20a) Find a common denominator for the fraction in (a) and $\frac{5}{6}$.

respect ratio (+1)

(+1) common multiples of 6 and 8 work: 24, 48, etc.

get a pair (+1)

so $\frac{3 \cdot 3}{8 \cdot 3} = \frac{9}{24}$ and $\frac{5 \cdot 4}{6 \cdot 4} = \frac{20}{24}$ work so does $\frac{18}{48}$ and $\frac{40}{48}$

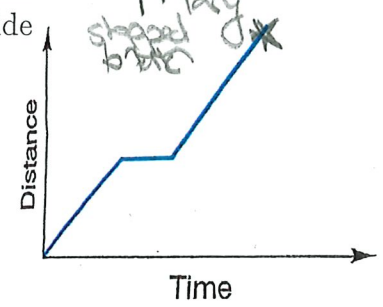
2. (ExtraPractice §9.3 #23) Two children go to school along the same road. Mary rode her bicycle but stopped to talk to a friend. Joel walked half the distance and then jogged the rest of the way. The following graphs show distance as a function of time for each of these students with the same scale on both axes.

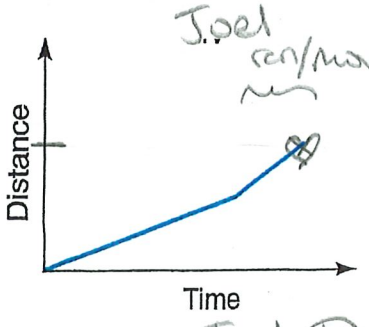
   (a) [3] Match each student with a graph. Provide some justification.

matched (+1)

justification (+1)

sense/interpret (+1)





   (b) [2] Which student lives closest to school? Justify your answer.

Joel (+1)

(+1.5) The student that had to cover less distance measured on vert. axis when finish travels Mary's distance (vert. comp of ♡) much higher than Joel's distance (vert. comp. of ♡) (+.5)

3. [3] (Quiz7 #1) Suppose you have a $\frac{3}{8}$-inch drill bit but the hole needs to be the next size down. The set of drill bits is measured in sixteenths of an inch. What size drill will you use?

have 3/8 inch

start (+.5)

want 1/16 less than what we have: $\frac{3}{8} - \frac{1}{16}$ (+1)

common den (+1)

$\Rightarrow \frac{6}{16} - \frac{1}{16} = \frac{5}{16}$ (+1.5)

want 5/16 drill bit.

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4. If n and m have the prime factorizations: $n = 5 \times 7 \times 7$ and $m = 3 \times 5 \times 7$,

(a) [2] (ActivityGCF#5) What is a common factor of n and m?

Common factors: 5, 7, and 5×7 or 35

sense/notation (+.5) (+.5) got one (+1)

(b) [3] (§4.2 #14) What is the least common multiple of n and m?

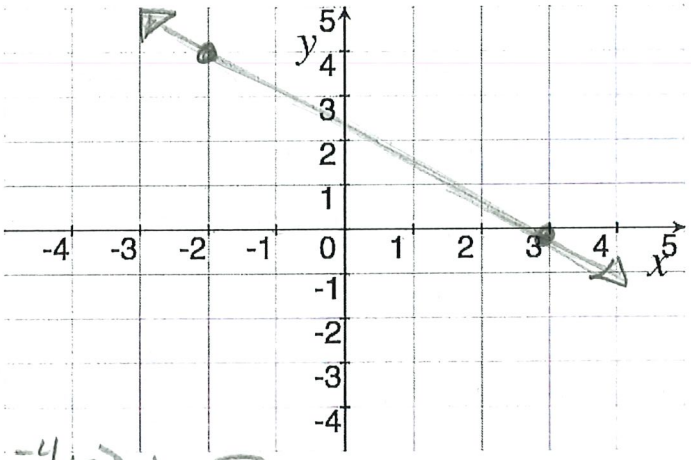
A multiple of both n and m

$(3\times5\times7)\times7 = 3\times5\times7\times7 = 3\times(5\times7\times7)$

$m\times7$ (735) $= 3\times n$

multiple (+1) least (+1) sense/notation (+.5) got it (+.5)

5. (9.2 #14) Consider the line that passes through (-2,4) and (3,0).



(a) [2] Graph the line on the axis.

start (+.5) points (+1) line (+.5)

(b) [3] Find the equation of the line.

(+.5) Looking for $y = mx+b$

$m = \text{slope} = \frac{\text{rise}}{\text{run}} = \frac{-4}{5}$ (+1)

Passes thru (3,0) so $0 = \frac{-4}{5}(3)+b$ (+.5)

$\Rightarrow 0 = \frac{-12}{5}+b \Rightarrow b = \frac{12}{5}$ (+.5) (+.5) so $y = \frac{-4}{5}x + \frac{12}{5}$

6. [5] (miniquiz & fracActivity #3) Perform the operations. Assume a and b are nonzero integers. Write your final answer in lowest terms. (Mixed numbers or improper fractions are both acceptable.)

(+1) Common den (+1) respect ratios (+.5)

$\frac{3}{14}+\frac{10}{21}$ $\qquad$ $\frac{2}{ab}+\frac{1}{3a}$ $\qquad$ $\frac{4}{5a^2}\times\frac{a}{2a+1}$

$\frac{3}{3}\frac{3}{2\cdot7}+\frac{10}{3\cdot7}\frac{2}{2}$ $\qquad$ $\frac{3}{3}\frac{2}{ab}+\frac{1}{3a}\frac{b}{b}$ $\qquad$ $\frac{4a}{5a^2(2a+1)}$ (+.5)

$\frac{9}{42}+\frac{20}{42}$ $\qquad$ $\frac{6}{3ab}+\frac{b}{3ab}$ $\qquad$ $\frac{4a}{5a\cdot a(2a+1)}$ legal simplification (+1)

$\frac{29}{42}$ $\qquad$ $\frac{6+b}{3ab}$ (+.5) $\qquad$ $\frac{4}{5a(2a+1)}$ got it (+.5)

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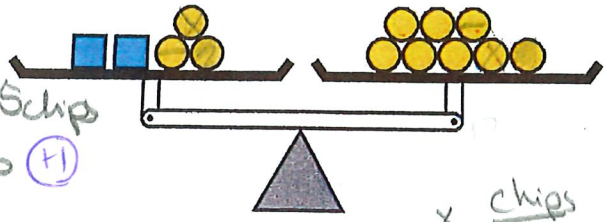
7. (§9.1 #6) Consider the balanced scales.

(a) [2] Determine the number of chips needed to replace each box in order for the scales to balance.

remove 3 from each side (+1)



need to replace 2 boxes with 5 chips
⇒ each box is 2.5 chips (+1)

(b) [2] Let x represent the number of chips for each box, write the corresponding equation that represents the scale.

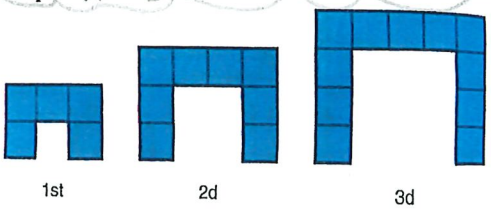
x chips / box

equals (+.5)
x used right (+.5)

$$\underbrace{2x+3}_{(+.5)} = \underbrace{8}_{(+.5)}$$

$2x+3=8$
$-3 \quad -3$
$2x=5$
$\frac{2x}{2}=\frac{5}{2}$
$x = 5\frac{1}{2}$ or 2.5

8. Consider the tile sequence to the right:



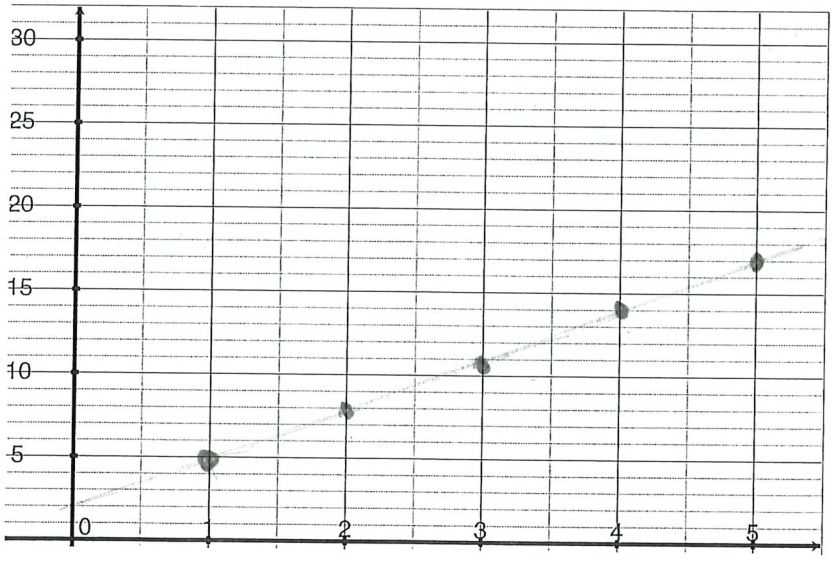
(a) [3] (§9.2 #24a) Create an input-output table with the figure number and the number of tiles in each figure for the first 5 figures.

pattern (+1)

figure #	# of tiles	
1	5	
2	8	+3
3	11	+3
4	14	
5	17	

(+1) (+1)

(b) [2] (LinesActivity #3) Graph the coordinate points on the axes.



each is +.5 one can be wrong with no penalty

(c) [3] (§9.2 #23) What figure will have 305 tiles? Provide some work so your process can be followed.

method (+1.5)

An algebraic rule would make this easier
# of tiles = 2 + 3(figure #) b/c line w/ slope 3 and y-intercept of 2

notation (+.5)

We want to find
$305 = 2 + 3(\text{figure \#})$
$-2 \quad -2$
$\frac{303}{3} = \frac{3(\text{figure \#})}{3}$
figure # = 101 (+1)

12

28
22
50 ave 73%

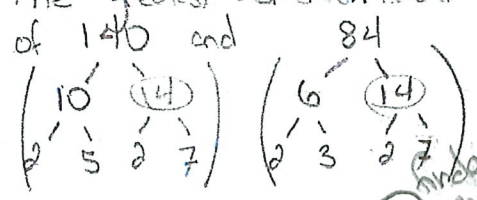
9. Grade the work that follows. The work may be correct or incorrect. If correct, briefly justify why. If incorrect, find the error(s) & try to detect the reason for the error.

(a) [3] (GCFActivity#3))

incorrect (+1)

what GCF is (+1)

The greatest common factor of 140 and 84



is 14 because 14 is the largest common factor on both factor trees. (+1) answer reason

error

greatest common factor is 2×2×7 or 28

Factor Trees don't list all the factors so it is not enough to compare factors in the trees. It's the prime factors that need comparing

(b) [3] (ExtraPractice5.3 #17)

$$\frac{11}{12} \div \frac{1}{3} = \frac{33}{36} \div \frac{12}{36} = \frac{33 \div 12}{36 \div 36} = \frac{33 \div 12}{1} = \frac{33}{12}$$

(+1) correct

fraction ÷ (+1)

(+1) This is one of the ways we can show division of fractions $\frac{a}{b} \div \frac{c}{d} = \frac{a \div c}{b \div d}$. Note common den makes this easier to simplify

(+1) There is also some simplification (36÷36=1) along the way

(c) [3] (Quiz6 #1)

"The multiples of 140 are: 1,2,4,5,7,10,14,20,..."

incorrect (+1)

multiple def (+1)

(+1) Perhaps there is a mixup of factor & multiples

Note multiples are generally larger such as 280, 420, etc

10. [1] What topic or concept did you study and prepare for, but not see on the exam?

primes?
parallel lines?
perpendicular lines?

any topic from class (+1)

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