



2018 National FFA Floriculture
Career Development Event
Problem Solving Exam



Directions: Select the best answer for each question and mark your selection on the separate scantron sheet provided. Mark answers in the **Exam 2** section located in the left hand side of your scantron.

Problem Solving #1

(Use the Cycocel Growth Regulator Information)

As a greenhouse employee you are mixing cycocel to drench potted plants at a high rate. You are mixing in a 55 gallon container. How many ounces of cycocel do you mix in the 55 gallons?

- A. 74.8 ounces
- B. 89.7 ounces
- C. 71.3 ounces
- D. 59.4 ounces

Problem Solving #2

Makayla works for a florist and is completing and order for a birthday arrangement. She used the materials listed below. What will the customer be charged assuming a 60% markup, 5.3% tax, and a \$12 delivery charge? There is no tax on the delivery charge.

Qty. Used	Item Description	Cost
1	Glass Vase	\$3.75 each
2.5 yards	Ribbon bow	\$.55 per yard
1 bundle	Leatherleaf Fern	\$3.25 per bundle
5 stems	Oriental Lily	\$2.25 per stem
6 stems	Rose	\$1.05 per stem
3 stems	Mums	\$.33 per stem
1 stem	Baby's Breath	\$.25 per stem

- A. \$61.22
- B. \$57.77
- C. \$43.47
- D. \$45.77

Problem Solving #3

(Use the Poinsettia Chart Provided)

Your agriculture teacher has explained the benefit of using multiple chemicals with different MOAs to tackle tough greenhouse pests. You currently have scale on your greenhouse crop and your teacher is looking for two different pesticides that treat the scale in all life stages. Your teacher has also requested that both of these pesticides can be sprayed after school once the students leave (5:00pm) but would also allow students to enter the greenhouse the next day when they arrive to school (7:00am). Which two chemicals would you recommend the school purchase?

- A. Safari and Target
- B. Tallus and Enstar II
- C. Safari and M-Pede
- D. Ultra -Fine Oil and Acephate Pro 75

Problem Solving #4

You want to mix up a 20-10-20 fertilizer concentrate in a 25-gallon tank that will be injected into the irrigation line through a Dosatron proportioner at a rate of 1:100. You will apply 150 ppm N to the crop. How much fertilizer do you weigh out for this concentrate tank, in pounds? 1 lb. has 16 oz.

- A. 0.63 lbs. 20-10-20 fertilizer in 25-gallons
- B. 15.6 lbs. 20-10-20 fertilizer in 25-gallons
- C. 62.5 lbs. 20-10-20 fertilizer in 25-gallons
- D. 250 lbs. 20-10-20 fertilizer in 25-gallons

Problem Solving #5

How many 3.8 Ft³ bags of compressed potting soil will it take to fill the following containers? Round up to the nearest whole bag.

325 – 12” Hanging Baskets

250 – 6” Standard Pots

550 – 4” Standard Pots

	Number of Pots Filled		
	1 CU FT	2.8 CU FT LOOSE	3.8 CU FT COMPRESSED
Standard 3”	123	346	864
Standard 4”	62	173	432
Standard 6”	15	43	108
Hanging Basket 10”	5	15	37
Hanging Basket 12”	3	9	22

- A. 24
- B. 15
- C. 19
- D. 18

Problem Solving #6

Haley wants to operate a plant rental business for special events as her SAE. To begin her business she has determined that she will have the following expenses:

10 Peace Lilies.....\$15 each
15 Ficus.....\$10 each
10 Ferns.....\$12 each
12 Nephytis\$8 each
3 cases (12 cans/case) Leaf Shine.....\$39 per case

If Haley averages 20 plants per month rental with all plants rented at the same price, how much would that rental price need to be per plant to cover all expenses for the year in addition to making \$50 profit per month?

- A. \$5.50
- B. \$3.15
- C. \$6.18
- D. D. \$5.14

Problem Solving #7

Your greenhouse production business has a contract to grow 320 flats of seed-propagated petunias to a local landscaping contractor. Each flat has an 0606 cell pack insert. You will source the plugs from a greenhouse supplier, which offers the plugs in 288-size plug trays. Each plug tray is guaranteed to have 280 usable seedlings. What is the number of 288 plug trays of petunias that you must order to be able to grow the plants to meet this contract?

- A. 36 plug trays
- B. 40 plug trays
- C. 42 plug trays
- D. 320 plug trays

Problem Solving #8

You have a 90 foot long greenhouse with an end-wall area of 240 square feet. You have decided to fumigate utilizing Methiocarb PT 1700 aerosol canisters. If each canister will treat a maximum of 2,500 cubic feet, how many canisters are required for a single treatment?

- A. 7 canisters
- B. 9 canisters
- C. 12 canisters
- D. 13 canisters

Problem Solving #9

Your FFA Chapter has partnered up with the school cafeteria to grow lettuce to be used on the school salad bar. You are growing 3 different varieties of lettuce in 3 different raised beds using drip irrigation. The raised beds are 15 feet long and are 4 feet wide allowing you to run two rows of lettuce with irrigation per bed. You have spaced the lettuce 12 inches apart giving you enough room to have 14 heads of lettuce per row with a drip emitter on each head of lettuce. Each drip emitter puts out 0.5 gallon of water per hour. The irrigation system is set to run 4 days a week for 30 minutes each day on each bed. How much water are you using in a week to grow the lettuce?

- A. 1 gallons
- B. 14 gallons
- C. 42 gallons
- D. 84 gallons

Problem Solving #10



In your school greenhouse there are three growing benches that run the length of the greenhouse. Each bench measures 4' x 75'. Your teacher typically likes to grow the school bedding plants in 606 web inserts which require a 1020 Web Flat to hold them. The web flats measure 11" X 21".

What is the approximate "maximum" number of 1020 flats that could be placed on these benches?

- A. 76
- B. 187
- C. 561
- D. 1250



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Answer Key

1. C. 71.3

In the table 1200 parts per million is not listed. Figure through a ratio of 1.08/1,000 to find out much to mix per 1200.

$$\frac{1.08}{1,000} = \frac{X}{1,200} \quad \text{This product is 1.296/gallon}$$

$$1.296 \times 55 \text{ gallons} = 71.28 = 71.3 \text{ ounces}$$

2. B. \$57.77

Total cost of materials is \$27.17.

\$27.17 x .60 (markup) is \$16.30

\$27.17 + \$16.30 = \$43.47

\$43.47 x .053 (tax) = \$2.30

\$43.47 + \$2.30 = \$45.77

\$45.77 + \$12 (delivery fee) = \$57.77

3. A. Safari and Target

- Safari and Target - two different class pesticides and both have REI less than 12 hours and treat all stages
- Tallus and Enstar II – *only one different class pesticide* and both have REI less than 12 hours and treat all stages
- Safari and M-Pede - two different class pesticides and both have REI less than 12 hours and *M-Pede only treats nymphs and adults*
- Ultra -Fine Oil and Acephate Pro 75 - two different class pesticides and *Acephate has REI of 24 hours and both only treat nymphs or adults*

4. B. 15.6 lb. fertilizer in 25-gallons, 100X strength

- Calculate the amount of fertilizer to weigh out at single strength, without taking into account the fertilizer concentrate. There are many ways to do this, but following is the calculation using the Rule of 75: 150 ppm N divided by 75 divided by 0.2 (which is the decimal fraction of nitrogen in the fertilizer carrier) = 10 oz. 20-10-20 fertilizer/100 gallons, single strength
- Increase the amount of fertilizer by the proportioner's dilution rate, 100: 10 oz. 20-10-20 fertilizer/100 gallons x 100 = 1,000 oz. 20-10-20 fertilizer/100 gal, 100X strength
- Determine the amount of fertilizer to weigh out for the smaller tank of 25-gallons: 1,000 oz. 20-10-20 fertilizer/100 gal x 25 gal = 250 oz. fertilizer/25 gal, 100X strength
- Convert oz. to lbs. 250 oz. divided by 16 = 15.6 lb. fertilizer in 25-gallons, 100X strength

5. C. 19 bales

325 – 12" Hanging Baskets $325/22=14.8$

250 – 6" Standard Pots $250/108=2.3$

550 – 4" Standard Pots $550/432=1.3$

$14.8+2.3+1.3= 18.4$ bales which rounds up to 19 bales

6. D. \$5.14

10 Peace Lilies..... \$15 each..... \$150

15 Ficus..... \$10 each..... \$150

10 Ferns..... \$12 each..... \$120

12 Nephytis \$8 each \$96

3 cases (12 cans/case) Leaf Shine..... \$39 per case \$117

Total Expenses \$633

Total Expenses: $\$150+\$150+\$120+\$96+\$117=\633

$\$633/12$ months= $\$52.75$ per month in expenses

$\$52.75 + \50 (desired profit) = $\$102.75$

$\$102.75/20$ rented plants = $\$5.14$

7. C. 42 Plug Trays

- Determine the number of usable plugs needed. 6×6 (from 0606) = 36 plugs per flat $\times 320$ flats = 11,520 usable plugs needed.
- Determine the number of plug trays needed to provide 11,520 usable seedlings. $11,520$ usable plugs needed / 280 plugs per 288 plug tray = 41.1 plug trays; must order 42 plug trays to meet order.

8. B. 9 canisters

- Find the volume of the greenhouse. 90 feet long $\times 240$ square feet = $21,600$ cubic feet
- With each canister covering up to $2,500$ cubic feet, determine the number of canisters needed for this greenhouse. $21,600$ cubic feet divided by $2,500$ cubic feet/canister = 8.64 canisters. 9 canisters are needed.

9. D. 84 gallons

4 days $\times 30$ mins a day = 120 mins per week

1 hour = 60 mins

0.5 gallon of water = 60 mins

X 120 min

$60X = 60$

$X = 1$ gallons of water per week per plant

There are 14 plants on a row

1 gallons $\times 14$ plants = 14 gallons per row

There are 6 rows total

14 gallons $\times 6$ rows = 84 gallons of water total per week

10. C. 561

The table measures $4'$ X $75'$ or $48''$ X $900''$.

$48''$ X $900'' = 43,200$ In.². (Each Growing Bench)

$11''$ X $21'' = 231$ In.². (Each Flat)

$43,200$ In.² / 231 In.² = 187 flats per growing bench

187×3 growing benches = 561 flats