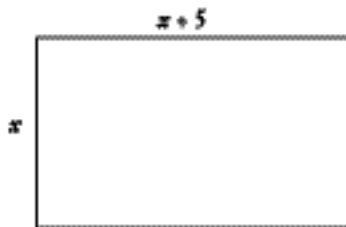


**ALGEBRA PRACTICE**

Now it's time to practice your skills. Answer the following 15 questions, and then review the answer explanations that follow.

1. To calculate her fee, an electrician uses the expression  $30n$  where  $n$  is the number of hours worked to calculate her fee. What is her fee if she works 3 hours?
  - a. \$33
  - b. \$90
  - c. \$60
  - d. \$27
2.  $F = 25A$  is the formula to find the number of pounds of fertilizer needed to cover a lawn.  $A$  is the area of the lawn in square feet. How many pounds of fertilizer ( $F$ ) are needed to cover a lawn with an area ( $A$ ) of 500 square feet?
  - a. 12,500 pounds
  - b. 2,000 pounds
  - c. 525 pounds
  - d. 100 pounds
3. To calculate profit ( $P$ ), a retailer uses the formula  $P = I - E$ . If the income ( $I$ ) is \$3,500 and the expenses ( $E$ ) are \$1,700, what is the profit?
  - a. \$5,200
  - b. \$1,800
  - c. \$800
  - d. \$2,200
4. A carpenter is using the diagram below to build a porch. The width of the porch,  $x$ , is 12 feet. What is the length?



- a. 17 feet
- b. 7 feet
- c. 10 feet
- d. 60 feet

5. A retailer is having a storewide sale. Every item is 10% off its original price. If  $p$  = the original price, which expression below represents the sale price of each item?
- $p - 0.10p$
  - $p + 0.10p$
  - $0.10p$
  - $p + 0.10$
6. The manager of a cafeteria uses algebraic expressions to calculate the number of servings she can prepare with the amount of food she has in stock. If each can of spaghetti sauce contains 20 servings, which expression below represents the number of servings in  $n$  cans of spaghetti sauce?
- $20 + n$
  - $20 - n$
  - $20 \times n$
  - $20 \div n$
7. A post is needed for every four feet of fencing. Which expression can be used to calculate the number of posts needed to fence a rectangular area if  $f$  is the number of feet of fencing?
- $f + 4$
  - $f - 4$
  - $f \times 4$
  - $f \div 4$
8. Joon is in charge of ordering bulk food for a sandwich shop. He purchases pickles on a weekly basis but recently switched vendors and needs to recalculate his order for the upcoming week. He estimates that they use 8 lbs of pickles each day (they are open 6 days a week). The new vendor only sells pickles in 20 lb containers. According to his estimate, what is the minimum number of containers Joon must order in order to guarantee he has enough pickles for the week?
- 3 containers
  - 4 containers
  - 5 containers
  - 6 containers
9. A restaurant charges 15% of the total bill for delivery. Which expression represents the delivery charge on a total bill,  $t$ ?
- $15 + t$
  - $0.15 + t$
  - $0.15t$
  - $15t$

- 10.** To calculate his weekly earnings ( $E$ ), a salesperson uses the formula  $E = 0.22s + 150$ , where  $s$  is his total sales. What did he earn last week if his sales were \$2,200?
- \$590
  - \$634
  - \$980
  - \$2,350
- 11.** A shipping company charges \$2.95 for the first 2 pounds and then \$0.30 for every ounce over 2 pounds. The cost for shipping a package is found using the formula  $C = 2.95 + 0.30w$ , where  $w$  is the number of ounces over 2 pounds. What is the cost to ship a package that weighs 2 pounds 14 ounces?
- \$3.09
  - \$2.14
  - \$7.15
  - \$4.55
- 12.** Rick works at a supermarket and has been instructed to set up a sale display with canned kidney beans. Each can weighs  $\frac{4}{5}$  lb. A sign on the shelf warns that each shelf cannot support more than 30 lbs of weight. What is the maximum number of cans that Rick can place on a shelf without exceeding the weight limit?
- 37 cans
  - 38 cans
  - 30 cans
  - 25 cans
- 13.** A cook uses the formula  $A = \frac{3}{2}n$ , where  $n$  is the number of customers, to determine how many cups of mashed potatoes are needed. How many cups of mashed potatoes does he need for 90 customers?
- 135 cups
  - 270 cups
  - 90 cups
  - 145 cups
- 14.** Long distance phone calls cost ten cents for the first minute plus four cents for each additional minute. Which expression below represents the cost of a phone call in cents? Let  $m$  equal the total number of minutes.
- $m + 40$
  - $10 + 4(m - 1)$
  - $10m + 4m$
  - $(10 + m)(4 + m)$

- 15.** Ohm's Law states  $I = \frac{E}{R}$  where  $I$  is the current in amperes,  $E$  is the electromotive force in volts, and  $R$  is the resistance in ohms. Solve Ohm's Law for  $E$ .
- a.  $E = IR$
  - b.  $E = \frac{I}{R}$
  - c.  $E = I + R$
  - d.  $E = ERI$

**ANSWERS**

1. b. Replace  $n$  with 3. Complete the multiplication:  $30 \times 3 = 90$ . Her fee is \$90.
2. a. Multiply 25 by the area of the lawn, 500 square feet;  $25 \times 500 = 12,500$ ; 12,500 pounds are needed.
3. b. Replace  $I$  with \$3,500 and  $E$  with \$1,700 and subtract;  $\$3,500 - \$1,700 = \$1,800$ .
4. a. The length is  $x + 5$ . Replace  $x$  with 12;  $12 + 5 = 17$  feet.
5. a. Subtract 10% of the original price,  $p$ , from the original price. To find 10% of the original price, multiply the decimal equivalent of 10% (0.10) by the original price,  $p$ :  $0.10p$ . Subtract this amount from the original price ( $p - 0.10p$ ).
6. c. The number of cans,  $n$ , must be multiplied by the number of servings in each can, 20. The algebraic expression which represents this calculation is  $20 \times n$ .
7. d. Since a post is needed for every four feet of fencing, divide the number of feet of fencing,  $f$ , by four to find the number of posts needed. The expression is  $f \div 4$ .
8. a. The sandwich shop uses 8 lbs of pickles per day. They are open 6 days a week, so to find the amount of pickles they use in a week, multiply  $8 \text{ lbs/day} \times 6 \text{ days/wk} = 48 \text{ lbs/wk}$ . Since the pickles are sold in 20 lb containers, Joon needs to buy 3 containers to cover them for the week, even though there may be 12 lbs left over.
9. c. Multiply the total bill,  $t$ , by the decimal equivalent of 15%, 0.15. This expression is  $0.15t$ .
10. b. Replace  $s$  with \$2,200. The equation becomes  $E = 0.22 \times 2,200 + 150$ . The rules for order of operations state that multiplication is always done before addition. Therefore, complete the multiplication ( $0.22 \times 2,200 = 484$ ) first, then add 150 to the result;  $484 + 150 = \$634$ .
11. c. Replace  $w$  with 14 since the package weighs 14 ounces over 2 pounds. The formula is then  $C = 2.95 + 0.30 \times 14$ . The order of operations states that multiplication is always done before addition. Multiply 0.30 by 14 ( $0.30 \times 14 = 4.20$ ) then add the result to 2.95;  $2.95 + 4.20 = \$7.15$ .
12. a. First, start by converting  $\frac{4}{5}$  to a decimal; 4 divided by 5 = 0.8. Since each can weighs 0.8 lbs and the shelf can hold 30 lbs, divide 30 by 0.8 to calculate how many cans can be placed;  $30 \text{ lbs} \div 0.8 \text{ lbs/can} = 37.5$  cans. Since you can't put 0.5 of a can on the shelf, the maximum number of cans that can be set on the shelf without exceeding the 30 pound weight limit is 37 cans.
13. a. Replace  $n$  with 90 in the formula:  $A = \frac{3}{2} \times 90$ . Calculate the right-hand side of the equation recalling that  $90 = \frac{90}{1}$ . Multiply the fractions by multiplying the numerators (tops) and then multiplying the denominators (bottoms);  $\frac{3}{2} \times \frac{90}{1} = \frac{270}{2} = 135$ ; 135 cups of mashed potatoes are needed.
14. b. The cost of a phone call is ten cents plus four cents multiplied by one less than the total number of minutes (the first minute costs ten cents, so it is not multiplied by four cents). This translates into  $10 + 4(m - 1)$ ;  $m - 1$  is in parentheses because it must be calculated before multiplying by four cents.
15. a. To solve  $I = \frac{E}{R}$  for  $E$ , multiply both sides of the equation by  $R$ . The  $R$ s cancel each other out on the right side of the equation, so the equation becomes  $IR = E$ . The equation can be flipped around to become  $E = IR$ , which is choice a.