

- List all factors of 56.
- Find the greatest common factor of 48 and 180.
 - Find the least common multiple of 48 and 180.
- Perform the division with remainder: $2016 \div 11$
- Label each of the following as true or false.
 - There is no prime number divisible by 3.
 - If a has a remainder of 2 when divided by 7 and b has a remainder of 5 when divided by 7, then the sum $a + b$ is divisible by 7.
 - If the product xy is divisible by 6, then x is divisible by 6 or y is divisible by 6.
 - If the product xy is divisible by 5, then x is divisible by 5 or y is divisible by 5.
 - If a number x is divisible by 3, then its square, x^2 is divisible by 9.
- Prove that each of the following decimals represent rational numbers by converting them to a fraction of two integers. You do not need to reduce the fraction to lowest terms.
 - 3.0458
 - $3.045\overline{8}$
 - $3.04\overline{58}$
 - $3.0\overline{458}$
- Compute the area of a right triangle with sides 34 cm, 16 cm, and 30 cm long. Include units in your computation and answer.
- Compute the area of the parallelogram determined by $A(-3, 2)$, $B(4, 2)$, $C(2, 6)$, $D(-5, 6)$.
- Graph the line $4x - 3y = -7$
 - Graph the lines $2x - y = 5$ and $x + 3y = 6$ in the same coordinate system. Use your graph to find the coordinates of the point where the lines intersect.
- Simplify each of the following.
 - $|11 - 3|-5|$
 - $|11 - |3 - 5||$
 - $|11|-3-5|$
 - $12 - 2(5 - 3(-2))$
 - $-3^2 - 12 \div 2 \cdot 3$
 - $\frac{18 - 5 + 3}{-2^2 - (-2)^2}$
 - $|3 - |-7 + 2||$
 - $\frac{6 - 2(-3)}{-2^2 - (-1)}$
- Simplify each of the following.
 - $-3^2 - 4(-5) + 24 \div 3 \cdot 2$
 - $\frac{3}{8} - \frac{1}{4} \cdot \frac{3}{5}$
 - $\left(-\frac{2}{5}\right)^2 - 3^{-1} + 5^{-1}$
 - $2 - 5(8 - 3(2 - (-1)^3))$
 - $\frac{13 - 5 + 6}{-2^3 + 8}$
 - $\frac{2^{-1} + 3^{-1}}{2^{-1} - 3^{-1}}$
- Evaluate $\frac{-x^2 + 10x - 21}{3 - x}$ if
 - $x = 2$
 - $x = 3$
 - $x = \frac{5}{2}$
 - $x = \sqrt{2}$
- Simplify each of the following.
 - $\frac{5}{2^{-2}}$
 - $\frac{(-2ax^3)^3(-3axa^2)^2}{(-2a^4x)^2}$
 - $-2^{-3} - (-3)^{-2}$
 - $\left(\frac{2}{3}\right)^{-2}$
 - $\frac{2^{-3} - 3^{-2}}{2^{-1}}$
 - -5^0
 - $\left(\frac{2}{3^{-1}}\right)^{-2}$
 - $(2 - 3^{-1})^{-2}$
 - $\left(\frac{-2x^{-2}y^3}{(-3)^3 x^{-5}y^7}\right)^0$

13. Simplify each of the following.

a) $\sqrt{3}(2 - \sqrt{3})$

b) $\sqrt{5}(\sqrt{2} - \sqrt{5})$

c) $(2\sqrt{5} - 1)(\sqrt{5} + 1)$

d) $(3\sqrt{7} - 2)^2$

e) $\sqrt{28} + 2\sqrt{63} - \sqrt{700}$

f) $\frac{\sqrt{200}}{\sqrt{18}}$

g) $\frac{\sqrt{40} - 6}{2}$

h) $\frac{\sqrt{45} - 12}{6}$

i) $(\sqrt{5} - 2)^3$

j) $(\sqrt{5} - 2)^4$

k) $(\sqrt{5} - 2)^0$

l) $(\sqrt{5})^{-4}$

14. Simplify $-x^2 + 6x - 1$ if

a) $x = -\sqrt{2}$

b) $x = \sqrt{3} - 2$

c) $x = 3 - \sqrt{7}$

15. Rationalize the denominator in each of the following.

a) $\frac{10}{1 - \sqrt{5}}$

b) $\frac{\sqrt{5} + 2}{\sqrt{5} - 3}$

c) $\frac{2\sqrt{x}}{\sqrt{x} + 3}$

16. Factor completely over the real numbers by completing the square or state if the expression does not factor.

a) $12x - 2x^2 - 16$

b) $12x - 2x^2 - 20$

c) $12x - 2x^2 - 4$

d) $3x^2 - 6x + 3$

17. Completely factor each of the following.

a) $4ab^2x - 30ab^2 + 2ab^2x^2$

c) $x^2 - 6x + 13$

e) $432x + 6x^2 - x^3$

g) $x^{16} - 25$

b) $12a^2x^2 - 75x^2$

d) $5a^7 - 5a^3$

f) $20m - 2m^2 - 50$

18. Solve each of the following equations.

a) $(3x - 1)(x + 1) - 2(x - 2)^2 = 14x - 9$

e) $(p - 4)(p - 8) = 60$

i) $x^2 - 2x = -5$

b) $5m^6 = 80m^2$

f) $6x = x^2 + 7$

j) $2 - (2x - 5) = (x - 4)^2$

c) $\frac{2}{3}(x + 2) - \frac{1}{2}(x - 4) = -\frac{x - 2}{5}$

g) $\frac{3}{4}x - \frac{x + 3}{5} = \frac{11x - 12}{20}$

d) $\frac{3x - 1}{4} - \frac{x - 2}{5} = x - 3$

h) $630x - 12x^2 = 2x^3$

19. a) Solve the equation $12x = 2x^2 + 4$ by completing the square.

b) Check your answer using exact values.

20. Solve each of the following.

a) Sally got a 5% raise. Now she is making \$2520. How much was she making before the raise?

b) A couch went on a 15% discount. The discount price is \$765. What was the original price?

21. The new number was 1811 250 000. What was the previous number if this new number represents

a) a 5% increase b) a 15% increase c) a 50% increase d) a 500% increase

22. A quantity was increased by 30% and then decreased by 10%. Express the two changes as a single change. What percent of an increase or decrease is this?

Answers

1. 1, 2, 4, 7, 8, 14, 28, 56

2. a) 12 b) 720

3. 183 R 3

4. a) false b) true c) false d) true e) true

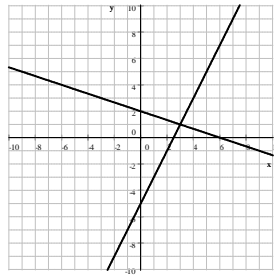
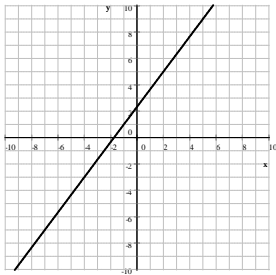
5. a) $\frac{30\,458}{10\,000}$ b) $\frac{27\,413}{9000}$ c) $\frac{30\,154}{9900}$ d) $\frac{30\,428}{9990}$

6. $A = 240 \text{ cm}^2$

7. 28 unit^2

8. a) $4x - 3y = -7$

b) (3, 1)



9. a) 4 b) 9 c) 88 d) -10 e) -27 f) -2 g) 2 h) -4

10. a) 27 b) $\frac{9}{40}$ c) $\frac{2}{75}$ d) 7 e) undefined f) 5

11. a) -5 b) undefined c) $-\frac{9}{2}$ d) $-7 + \sqrt{2}$

12. a) 20 b) $-18ax^9$ c) $-\frac{17}{72}$ d) $\frac{9}{4}$ e) $\frac{1}{36}$ f) -1 g) $\frac{1}{36}$ h) $\frac{9}{25}$ i) 1

13. a) $2\sqrt{3} - 3$ b) $\sqrt{2}\sqrt{5} - 5$ c) $9 + \sqrt{5}$ d) $-12\sqrt{7} + 67$ e) $-2\sqrt{7}$ f) $\frac{10}{3}$ g) $\sqrt{10} - 3$

h) $\frac{\sqrt{5} - 4}{2} = \frac{\sqrt{5}}{2} - 2$ i) $-38 + 17\sqrt{5}$ j) $17\sqrt{5} - 38$ k) $161 - 72\sqrt{5}$ l) 1 m) $\frac{1}{25}$

14. a) $-3 - 6\sqrt{2}$ b) $-20 + 10\sqrt{3}$ c) 1

15. a) $-\frac{5(\sqrt{5} + 1)}{2}$ b) $-\frac{5\sqrt{5} + 11}{4} = \frac{-5\sqrt{5} - 11}{4}$ c) $\frac{2\sqrt{x}(\sqrt{x} - 3)}{x - 9} = \frac{2x - 6\sqrt{x}}{x - 9}$

16. a) $-2(x - 2)(x - 4)$ b) does not factor c) $-2(x - 3 + \sqrt{7})(x - 3 - \sqrt{7})$ d) $3(x - 1)^2$

17. a) $2ab^2(x - 3)(x + 5)$ b) $3x^2(2a - 5)(2a + 5)$ c) does not factor d) $5a^3(a^2 + 1)(a + 1)(a - 1)$

e) $-x(x - 24)(x + 18)$ f) $-2(m - 5)^2$ g) $(x^8 + 5)(x^8 - 5)$

18. a) 0, 4 b) -2, 0, 2 c) -8 d) 7 e) -2, 14 f) $3 - \sqrt{2}, 3 + \sqrt{2}$

g) all real numbers h) 15, 0, -21 i) no solution j) 3

19. a) $x_1 = 3 + \sqrt{7}$ $x_2 = 3 - \sqrt{7}$

b) If $x = 3 - \sqrt{7}$

$$\text{LHS} = 12(3 - \sqrt{7}) = 36 - 12\sqrt{7}$$

$$\begin{aligned} \text{RHS} &= 2(3 - \sqrt{7})^2 + 4 = 2(9 - 3\sqrt{7} - 3\sqrt{7} + 7) + 4 = 2(16 - 6\sqrt{7}) + 4 = 32 - 12\sqrt{7} + 4 \\ &= 36 - 12\sqrt{7} \end{aligned}$$

The other solution goes similarly.

20. a) \$2400 b) \$900

21. a) 1725 000 000 b) 1575 000 000 c) 1207 500 000 d) 301 875 000

22. 17% increase

Last revised: October 12, 2016