

**Practice Exam 1**  
**Chapters A-D and 1**

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**Simplify using exponent rules.**

1.  $\left(\frac{16x^{-2}y^6}{x^8y^{-4}}\right)^{-1/2}$

2.  $\sqrt[3]{4xy^2}\sqrt[3]{2x^5y}$

3.  $\sqrt{x^2}\sqrt{x^3}$

**Perform the indicated operation and simplify.**

4.  $\frac{x^2 - 10x + 21}{2x^2 - 12x - 14} \div \frac{x^2 + 2x - 15}{2x^2 + 12x + 10}$

5.  $\frac{3}{y^2 + 6y + 8} - \frac{2}{y^2 - 4}$

**Solve the inequality. Write your solution in interval notation and graph it on the real number line.**

6.  $x^2 - x - 6 > 0$

7.  $-14 \geq -4 - 2x > -28$

**Solve the quadratic equation by factoring.**

8.  $x^2 + x = 30$

**Solve the quadratic equation by any method learned in class.**

9.  $x^2 + 7x + 1 = 0$

**Factor completely.**

10.  $y^2(x^2 - 4) - (x^2 - 4)$

11.  $27p^3 - 1$

12.  $3x^3 + 6x^2 - 2x - 4$

13.  $144x^2 + 49$

14. Let  $P(2, 1)$  and  $Q(3, -2)$  be two points in the coordinate plane.

(a) Find the distance between the points  $P$  and  $Q$ .

(b) Find the midpoint between the points  $P$  and  $Q$ .

15. A set of data is given in the following table. Find a linear equation to model the data. Use your model to predict the value of  $y$  when  $x = 20$ .

$x$	$y$
0	12
1	17
2	22
3	27
4	32

16. A set of ordered pairs defining a relation is given below.

$$\{(5, 2), (4, 6), (2, 3), (2, 1)\}$$

- (a) Find the domain of the relation.
- (b) Find the range of the relation.
- (c) Sketch a diagram of the relation.
- (d) Does the relation define a function?

17. Consider the function given by

$$r(z) = \frac{8(z - 4)^2}{.}$$

- (a) What is the name of the function?
- (b) What letter represents the input?
- (c) What is the output?
- (d) Find  $r(3)$ . What does it represent?
- (e) What is the domain of the function?

18. When a skydiver jumps out of an airplane from a height of 13,000 ft, her height  $h$  above the ground after  $t$  seconds is given by the function

$$h(t) = 13,000 - 16t^2.$$

- (a) Find  $h(10)$  and  $h(20)$ . What do these values represent?
- (b) For safety reasons a sky diver must open the parachute at a height of about 2500 ft (or higher). A sky diver opens her parachute after 24 seconds. Did she open the parachute at a safe height?
- (c) Find the net change in the sky diver's height from 0 to 25 seconds.